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THE AMERICAN HOROLOGIST

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To inculcate the principles of the U. H. A. of A., fraternal and commercial advancement; to promote the welfare and enhance the betterment of its members; to cultivate good fellowship and a higher degree of knowledge in Horology; to be sent free monthly to all members. National membership, $2.00 per year. Make application to nearest secretary or representative. Addresses can be secured in the NATIONAL AND LOCAL INFORMATION column in this issue.

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WATCH FOR ANNOUNCEMENT OF OUR NEW JUNIOR MODEL

Proficiency and Efficiency

By D. L. THOMPSON

A watchmaker needs to be both highly proficient and highly efficient in his work if he is to realize any great amount of success in his trade.

Proficiency means a degree of advancement in any branch of knowledge, science, or art. Efficiency means the state of being efficient, or having the ability to perform a given piece of work with perfection and dispatch. Degree, for our purposes, means the grade or rank conferred by diploma or examination.

From the above one sees that there may be many degrees of proficiency and of efficiency. Also, that one may be highly proficient in the knowledge of how a certain piece of work is to be done and inefficient in its performance and, on the other hand, one may be highly efficient in doing certain jobs and low in proficiency in regard to his knowledge of the art of watchmaking in general.

A watchmaker can become both highly proficient and highly efficient by studying and practicing his art, by planning his daily work, and by thinking only of his work while at the bench.

Progress in the art of horology depends upon the workman's interest in his work and upon an intelligent method of procedure in advancing himself. He should read everything pertaining to his art and practice those things that are of every day use until he is efficient in their accomplishment. He should start the day with a clean bench and clean tools; lay out on the bench, to the right and left of the working space and within handy reach, those tools he constantly uses in the order that he uses them most and train himself to place them back in the same order when changing to others; keep the tools he uses less frequently in drawers in his bench and always in the same drawer and in the same order in the drawer; have several sizes of screwdrivers and tweezers and change to the correct ones when necessary; keep his tools always in good condition; and place his materials in order in drawers in his bench or within arms' reach of the bench so that he can quickly find whatever he may need. A few seconds saved in finding the tool or part he wishes to use amounts to minutes in the day and to hours in a week. This will also save a tremendous amount of nervous energy that may be lost daily in jumping up from the bench frequently to find a tool or part. The energy, together with the time, saved by system in arranging his work makes for both proficiency and efficiency which is the only real measure of his progress in his trade.

Keep a mental record, or a written one, of the operations in your daily work that may be taking more time than they should. Study up on these and if you are still confused take them to your fellow watchmakers in your Guild and they will be glad to help you clear them up. Don't be afraid, or unwilling, to admit your lack of knowledge in regard to certain adjustments and methods of procedure in your work as this attitude will tend to keep you ill informed and delay your progress in the art. There are members of your Guild who will be glad to assist you. There is an old saying that is as true now as it ever was, "When in doubt seek advice from those who know from experience." There are some things your brother watchmakers may be hazy on and they will thank you for helping them to find a solution to their problems. Guilds are fraternities organized for promoting the welfare of their members and this includes increasing their proficiency and efficiency. Take an active part and you will soon see an improvement in your ability as a watchmaker and a change for the better in your business.

The United Horological Association maintains a department which gives technical advice on any horological problem. Feel free to ask for advice on any problem that may confront you.

United Horological Association of America, Inc., Fourth Annual Convention, Boston, Massachusetts, Convention Program

In addition to the regular program there will be special meetings as well as special organization meetings, following the evening sessions. The time will be announced at the morning or afternoon sessions during our convention.

MONDAY, MAY 16 Morning

9:00 A. M.—Registration.
Presentations of Credentials.

11:00 A. M.—Official Opening of Exhibit.

12:00 Noon—Recess for Luncheon.

Afternoon

2:00 P. M.—Opening Session. President Tom Fagan, Presiding.
Roll Call of Officers.
Report of Delegates.

2:30 P. M.—Report of National Office, Orville R. Hagans, Exec. Sec.
Report of Officers.
Report of Executive Board.
Report of Trustees.

3:30 P. M.—Report of Legal Advisor, Mr. B. W. Heald.
Report of National Historian, Mr. Joseph A. H. Voss.
Report of National Committees.

4:30 P. M.—Report of Convention Committee, Col. Wm. H. Bright.
Appointment of Committees.

5:00 P. M.—Recess until 8:00 P. M.

Evening

8:00 P. M.—President Thomas J. Fagan, presiding.
Address of Welcome by (Boston Official).

8:30 P. M.—Address, "Activities of Your Association," by National President, Thomas J. Fagan.

8:45 P. M.—Address by Past President of U. H. A. of A., Frank Foegler.

9:00 P. M.—Address by Vice President, A. R. Raphael.

9:15 P. M.—Address by Harrison F. Babcock, President of H. I. of A.

9:45 P. M.—Address by George Engelhard, Publisher of National Jeweler.

10:30 P. M.—Recess until Tuesday May 17, at 9:00 A. M.

TUESDAY, MAY 17 Morning

9:00 A. M.—Vice President Raphael, presiding.
Report of Resolution Committee and Discussions.

10:00 A. M.—Recess. The entire body will take busses, provided by the Waltham Watch Co., on an extended sight seeing tour to Lexington and Concord then to the Waltham Watch Co., where luncheon will be served, and a visit through the factory, as guests of the Waltham Watch Co.

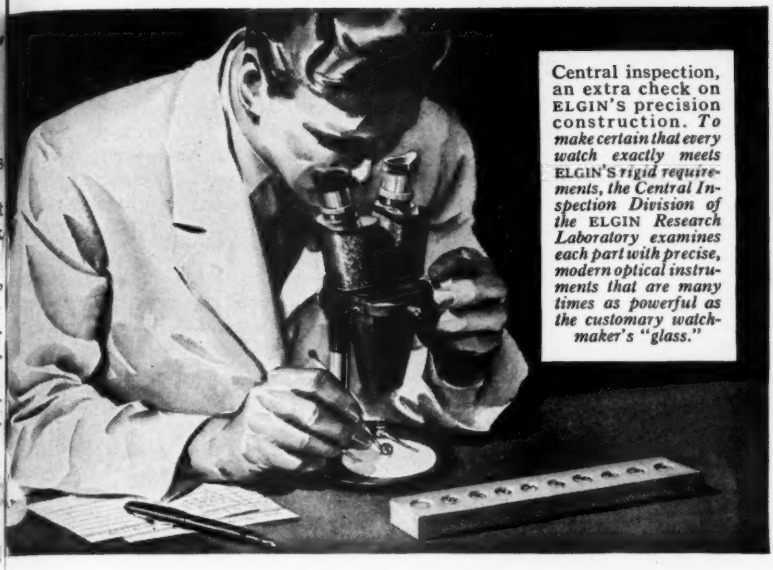
Evening

8:00 P. M.—President Thomas J. Fagan, presiding.
General Session.

8:30 P. M.—Technical Lecture by Mr. J. Friestadter, Supt. of Waltham Watch Co.

9:15 P. M.—Talk by Harry R. Markau "The Adoption of Chemical Warfare Gas in Societies Never Ending War With Crime," Lake Erie Sales.

(Continued on Page 26)



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When the Jeweler Gives His Note

By CHARLES R. ROSENBERG, JR.

WHEN a jeweler gives his negotiable note to finance the buying of fixtures and equipment for his store, one of two things is sure to happen. Either he benefits by being able to use the new equipment while paying off the note in installments, or he pays full price for useless, shoddy stuff. It's just the difference between legitimate financing and "legal" swindling with the unwary jeweler on the paying end.

The jeweler in the market for new equipment naturally compares prices before he buys. One house, he finds, quotes a figure appreciably below the others. This particular concern is not well known but under the terms they offer, he can't lose. They're willing to take a comparatively small down payment when the stuff is delivered and his note, payable in monthly installments, for the balance. At the worst, he figures, he couldn't lose more than the down payment if the goods turned out to be unsatisfactory. He could simply refuse to make any more payments until the seller made good on the equipment.

So he makes the deal. The well-known, established concerns are all very good, but their prices are high in comparison—and why shouldn't he save the difference by taking advantage of the low figures quoted by the unknown house? Especially since he can protect himself if things go wrong?

The equipment is delivered and installed. There are two or three things about it that he doesn't exactly care for, but the only way to judge, he realizes, is to give the stuff a fair trial. He has a month before the first payment on his note comes due.

As a matter of fact, he doesn't need a month. Within a week he knows that the equipment he has bought is worthless stuff. No jeweler, anywhere, would or could use it. He loses no time in writing to the concern from whom he bought it, pointing out in detail just what is wrong and notifying them that he will make no further payments until his complaints are adjusted to his satisfaction. Naturally, he assumes, they'll have a man around within a few days. That refusal to make further payments will bring them to time.

A month goes by, and the puzzled jeweler receives no reply to his letter. The threat to withhold payments doesn't seem to be effective. Either that, or else this concern is unbelievably slow and inefficient on service.

It's true that the threat not to pay has no effect, but, although he doesn't know it yet, the hapless jeweler will soon learn with something of a shock that this "low price" outfit is neither slow nor inefficient. On the contrary, they're speedy and highly efficient, though not in the way he had hoped for.

The news comes just a few days after the end of the month. It's a telephone call from the local bank.

"Your note is here for collection," comes the voice over the wire.

"Note? What note?" The jeweler knows he has no notes at the bank.

The man on the 'phone explains briefly. Something about "defaulted installment" and "full amount due and payable."

"Better stop in and see us before the end of the day," the voice from the bank advises.

Of course the whole thing is a mistake, the jeweler realizes, but he decides to set it straight with the bank. Just a business courtesy to them.

Later in the day as he sat facing the bank's cashier he couldn't believe his ears.

"I'm sorry," the bank official was saying, "but I'm afraid you're caught for the full amount, even though the goods are absolutely worthless."

"It doesn't make sense. It's all wrong," the jeweler said incredulously.

"Morally, it's all wrong," the cashier

conceded, "but unhappily you're on the wrong side of the law. As soon as this concern obtained your note they negotiated it to a finance company. In other words, the finance company bought your note, expecting to collect the installments on it as they came due. That's an entirely legitimate deal. Legitimate manufacturers do it all the time to finance installment sales. The money the manufacturer gets from the bank or finance company enables him to finance the sale and extend installment terms to his customer.

"But some outfits are in the business of getting notes rather than selling goods. With them, the delivery of the goods is simply an excuse for obtaining a business man's negotiable note. Now if they held onto the note, that would not be so bad, because the business man could defend himself when sued on the note by showing that the goods which he received were worthless."

"Isn't that my case?" he asked.

"I'm afraid not. The finance company that bought your note is what the law calls a 'holder in due course' and you cannot set up against a so-called holder in due course the defense that you might have made against this concern that got your note in the first place. The holder in due course, in this case, the finance company, paid its money for your note in good faith. They had no knowledge that the equipment you received for the note was worthless. As you have failed to pay one installment on the note, the note is what the law calls 'accelerated,' that is, the full amount is due and payable at once."

"What it all boils down to," the jeweler summarized bitterly, "is that I have to keep equipment that I can't use and can't sell and pay the full price for it—all because they got my note."

"That's about it. Of course, you can sue the equipment concern for damages, but my observation in these transactions is that such outfits are usually law-proof or financially irresponsible."

"How's a business man to protect himself, anyhow?" demanded the jeweler.

"In just one way," declared the cashier. "Deal only with houses with a good reputation. They may ask for your note in order to finance a time payment sale, but you're safe in giving it to them. First, they'll go the limit to satisfy you because they have a reputation to maintain in the trade. Then, too, they can't afford any funny business with notes because a suit for damages might mean heavy financial loss as well as loss of prestige."

So, when a jeweler gives his note, it's not the giving but the "to whom" that counts!

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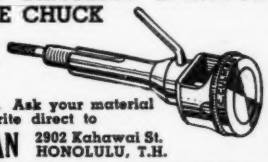
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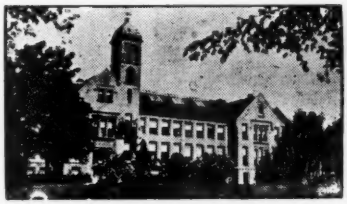
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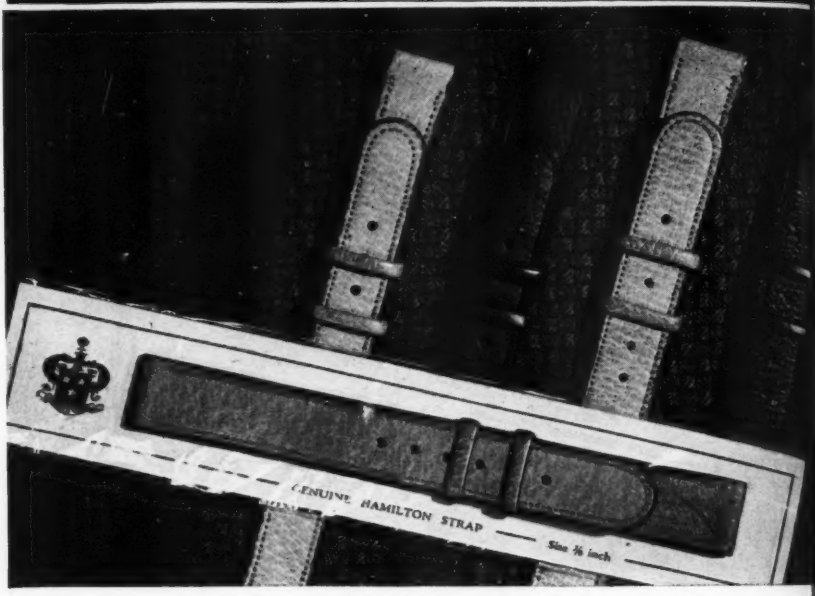

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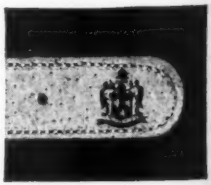

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Book Reviews—The Horologist's Library

This month we have selected for review a book by J. E. Haswell, entitled "Horology, the Science of Time Measurement and the Construction of Clocks, Watches, and Chronometers."

This is a volume of 267 pages and is well illustrated with 254 drawings and nineteen photographs. It is published in England, and is, we believe, the latest compilation of information on the subjects covered to be found in one volume.

The work is both an historical and a practical treatise and covers the principles of operation and constructional data of clocks, watches and chronometers in a thorough and comprehensive manner. While this work is not to be considered as a handbook on repairs it is both a text-book for the student and a work of reference for the experienced workman.

In Part I, the introductory, the author covers the mathematics of Time Measurement and gives a short history of early Time Recorders.

In Part II, Clocks, the author has covered his subjects about as completely as could be desired from a descriptive, both illustrative and verbal, as well as a mathematical standpoint, going into all manner of clocks, both weight and spring driven, and including Electrical Clocks.

In Part III, Watches, the author has covered watches in as complete a manner as he has clocks. The illustrations of Chronographs and Stop Watches, Repeating Watches, Tourbillons and Karrusels, and the drawings and descriptions of them are particularly interesting and instructive.

In Part IV, Marine Chronometers, the author has in this, the concluding, part of his most instructive book given a full description of the English two-day Marine Chronometer with fusee, and its history. There is also a description of the various styles of Chronometer Balances and the helical balance spring. The volume is concluded with photographs and descriptions of Surveying Chronometers and Chronographs.

The table of contents follows:

Part I. Introduction. Chapter 1. Time Measurement. Chapter 2. Time Recording.

Part II. Clocks. Chapter 3. Pendulums. Chapter 4. Clock Escapements. Chapter 5. Trains, Motion Works, and Gearings. Chapter 6. Weight Driven Clocks. Chapter 7. Spring Driven Clocks. Chapter 8. Striking and Chiming Mechanisms. Chapter 9. Calendar Mechanisms, Alarms, and Supplementary devices. Chapter 10. Electrical Clocks.

Part III. Watches. Chapter 11. Types of Movements. Chapter 12. Watch Trains. Chapter 13. Balance and Balance Springs. Chapter 14. Watch Escapements. Chapter 15. Mainsprings, Fusees, and Going Barrels. Chapter 16. Keyless Mechanisms. Chapter 17. Chronographs and Stop Watches. Chapter 18. Repeating Mechanisms. Chapter 19. Epicyclic Trains-Tourbillons and Karrusels.

Part IV. Marine Chronometers. Chapter 20. Marine Chronometer Trains, Escapements, Balances and other Data. Including Surveying Chronomenters and Chronographs.

This book may be procured from the Book Department of THE AMERICAN HOROLOGIST. Price postpaid $7.00.

—D. L. T.

Rare Watch Exhibit

Burlington, Vt.—A total of 34 watches, of various ages, made by a number of watchmaker in several European countries, have been presented to the Fleming Museum of the University of Vermont by Henry E. Schnakenberger, New York artist.

Some of the watches date back to the seventeenth century. The cases of most of the watches are elaborately designed with enamel and jewelry work.

Those distinguished for honesty and activity, rarely, if ever in this land of business energy, lack employment.

An Adjusted Watch

A FULLY adjusted watch is one that has been adjusted to five positions, three temperatures, and for isochronism. These adjustments take a long time and many trials to get perfect time or to within the tolerances set for the particular grade of watch.

In discussing this subject from the standpoint of the practical repairer, we all know that when a watch has met with an accident which makes it necessary to replace a balance staff that the position rates will be altered considerably and that much time spent in careful rating will be required to poise the balance, adjust hairspring and possibly alter shape of the balance pivots.

When the balance is being poised the hairspring has been removed and when it is put on it will upset the poise of the balance due to the fact that part of its weight is borne by its stud and part by the balance. There is no means of determining how the weight is actually distributed so the balance must be poised without the hairspring as nearly perfect as possible, the spring put on, and the balance put in place in the movement.

Adjustment for temperature.—When a watch is to be fully adjusted the work is started by adjusting the balance to temperature which means that the weight of the screws is adjusted on the segments of the balance so that the watch will show an equal, or nearly equal, rate when run for several days in heat and then in cold. The temperatures used should be about 5 degrees C. (41 degrees F.) for cold; 35 degrees C. (95 degrees F.) for heat, and 20 degrees C. (68 degrees F.) for the middle temperature test.

In making the tests for temperature adjustment the watch, when it has been running on time for several days in cold, is set by a regulator, and its rate noted. It is then run for 24 hours in heat and a comparison made. If it is slow in heat, it is under-compensated and one or more screws should be moved nearer the free ends of the segments. If it is fast in heat it is over-compensated and the screws should be moved farther away from the free ends of the segments. This procedure is followed until the watch shows an equal rate, or nearly so, when run for several days in cold and in heat. It will be found that moving a pair of screws one hole will make a change of several seconds a day.

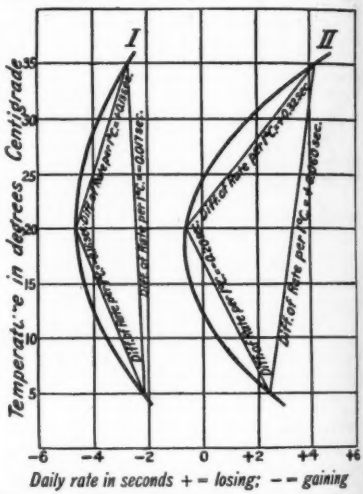

Figure 1—Temperature curves of watches. Curve I is that of an exceptionally well compensated watch with a brass-steel balance wheel; Curve II shows an average performance of a watch meeting the requirements as to temperature compensation for a National Bureau of Standards class A certificate.

In Fig. 1 is shown a graph of the temperature curve of watches meeting the requirements as to temperature compensation for a National Bureau of Standards Class A certificate. From this graph it will be seen that the variations that take place usually follow approximately the form of a parabola, and the adjustment of the timepiece is so made as to bring the point of the greatest gaining rate as near as possible to the temperature at which the timepiece is ordinarily used and to make the rates at the high and low temperatures approximately

(Continued on Page 47)

Alive With Organization Activities, April—May—June
Watchmakers and Jewelers Attention

We find our publication crowded this month, crowded not only with news, but activity. Therefore, we are condensing all engagements and meetings where the Executive Secretary will appear.

Do not fail to contact the sponsors of these meetings for complete details.

City State	Date	Meeting Place	Sponsors
Omaha, Nebraska	April 24	Rome Hotel, 1 P.M.	Horo. Assn. of Nebraska
Sioux City, Iowa	April 25	Jackson Hotel	Representative P. Berglund
St. Paul, Minnesota	April 26	Midway Commercial Club, 1931 University Avenue, 7:45 P.M.	St. Paul's Guild
Madison, Wisconsin	April 27	Lorrain Hotel	Wisconsin Watchmaker's Association. Madison Guild.
Elgin, Illnois	April 28	Elgin Watch-Makers College, 3 P.M.	Elgin Watchmaker's College
Chicago, Illinois	April 29	Palmer House	Chicago Jewelers Guild
Detroit, Michigan	May 1	Detroit-Leland Hotel	Creation of a new organizaton
Toledo, Ohio	May 2	University of the City of Toledo	Toledo Guild
Cleveland, Ohio	May 3	Guild Hall Builders Exchange Bldg., Prospect Ave. and Ontario Street	Horological Society of Cleveland
Pittsburgh, Penn.	May 4	Roosevelt Hotel	Horological Assn. of Penn.
Buffalo, New York	May 5	Statler Hotel	Creation of new organization Albert J. Grohs, Vice-President of New York Horological Ass'n
Niagara Falls, N. Y.	May 6	(Unknown)	Creation of new organization Albert J. Grohs, Vice-President of Horo. Assn. of New York
Toronto, Canada	May 7-8	King Edward Hotel	Canadian Jewelers Assn.
Elmira, New York	May 9	(Unknown)	Horological Assn. of Rochester
Rochester, New York	May 10	Powers Hotel	Horological Assn. of Rochester
Syracuse, New York	May 11	(Unknown)	Horological Assn. of Rochester
Albany, New York	May 12	The Ten-Eyck Hotel	Creation of new organization Representative John De Vogel
Portland, Maine	May 13	(Unknown)	Portland Watchmakers Assn.
Boston, Mass.	May 14	Statler Hotel	U. H. A. A. National Convention
Boston, Mass.	May 15		
Boston, Mass.	May 16		
Boston, Mass.	May 17		
Boston, Mass.	May 18		
Boston, Mass.	May 19		
New Haven, Conn.	May 20	Taft Hotel	Connecticut Horo. Associaton
N. Y. City, N. Y.	May 21	(Secy. Hotel: Belmont Plaza)	Greater New York Watchmakers' Guild
N. Y. City, N. Y.	May 22		
N. Y. City, N. Y.	May 23	Metropolitan Museum of Art	Timeology Guild (This Guild being created)
N. Y. City, N. Y.	May 24	Bowman Technical School	Bowman Technical School, Lancaster, Pennsylvania
N. Y. City, N. Y.	May 25-26		
Lancaster, Penn.	May 27	Philadelphian Hotel	Baltimore Watchmakers' Guild
Philadelphia, Penn.	May 28	Kur Jewelery Co., 417 Seventh St., N. W. Washington, D.C.	Kur Jewelry Company (Executive Secretary's headquarters will be at the Willard Hotel)
Baltimore, Maryland	May 29	Brown's Restaurant, 321 Granby St., Time: 6:30 P.M.	Horological Association of Virginia
Washington D. C.	May 30-31	Plaza Hotel	Greater Watchmakers' Guild of Miami
Washington, D. C.	June 1	Chamber of Commerce Auditorium	Tampa Watchmaker's Guild
Norfolk, Virginia	June 3	Mfgrs. Bldg, 815 Broad Street	Guild No. 2
Miami, Florida	June 5-6	Noel Hotel	Guild No. 1
Havana, Cuba	June 7-8-9	Hotel Sinton	Cincinnati Guild
Miami, Florida	June 10-11-12	Fort Hayes Hotel	Dayton Guild
Tampa, Florida	June 13		Columbus Guild
Atlanta, Georgia	June 14		Indiana Watchmakers' Ass'n.
Chattanooga, Tenn.	June 15		Indiana Watchmakers' Ass'n.
Nashville, Tenn.	June 16-17		Calumet District Guild
Louisville, Kentucky	June 18-19	(Secy.—Hotel Lorraine)	
Cincinnati, Ohio	June 20		
Dayton, Ohio	June 21		
Columbus, Ohio	June 22		
Indianapolis, Indiana	June 24		
Lafayette, Indiana	June 25		
East Chicago, Indiana	June 26		
Chicago, Illinois	June 27		
Davenport, Iowa	June 29		
Des Moines, Iowa	June 30		
Denver, Colorado	July 1		3226 E. Colfax Ave., Denver, Colorado

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To All Affiliated Groups and Delegates

To all associations sending representatives and delegates to the Fourth National Convention of U. H. A. A. in Boston, Massachusetts, May 16th to 18th, please observe those parts of the National By-Laws dealing with representation.

This year, strict observance of the laws will be envoked without any exceptions granted as has at times been practiced in the past.

We refer you to ARTICLE IX, Sections 1, 2, 7, 8, 9 and 10. Please don't overlook Section 10, you must have proper credentials properly executed. Sections 11, 12 and 13 are also of grave importance.

National Executive Board Meeting

The Executive Board will assemble in the offices of Executive Secretary in Hotel Statler, Boston, Mass., promptly at 10 a. m., Sunday, May 15th. Executive Board Chairman Frank Foegler will preside.

National Trustees Board Meeting

The Board of Trustees will assemble in the offices of Executive Secretary at 9 a. m., May 16th. The board will elect their own chairman.

General Assembly and Formal Opening

May 16th at 10 a. m. President Thomas J. Fagan presiding.

Special Meetings

There will be a special meeting of all Secretaries, both Guild and State, in the office of National Executive Secretary. This meeting will be called at a time which will not interfere with regular business sessions. Every secretary present at convention should be present. Those secretaries not present should advance through National Secretary their ideas regarding the handling of our secretarial work.

Purpose of meeting is to simplify our general methods and bring about a

method of book work which all approve. During last convention, in Chicago, the National office was empowered to create and distribute a uniform ledger. This was not completed as we would rather confer with all secretaries and thereby bring about a simplified system agreeable to all those who happen to be cursed with the job of secretary.

This and many other business subjects will be discussed and worked out, subjects affecting secretaries only, who, in the most part, are the reflection of any organization. Our meeting will be confined to our particular offices only and our findings shall be presented to the assemblage.

Presidents of Guilds and State Associations

There will be a special meeting for all Presidents of Guilds and State Associations. This meeting will be held in the Secretary's office, time will be announced after arrangements have been made during the convention. This meeting will be presided over by Mr. J. A. H. Voss, who has a timely and beneficial program for you who are destined to guide and head Horological groups. Every president should plan to partake of this meeting.

Unorganized Groups or Individuals Desiring to Organize

There will be a special meeting held to acquaint you with the proper procedure of organizing, as well as to acquaint you with the aids to be had from U. H. A. A. Any group or individuals desiring a purely organization lecture on such subjects should attend this special meeting, which will be addressed informally by leaders in this work.

This meeting will be under the direction of the Executive Secretary and we invite open discussion on any organization problem or endeavor. At this meeting all Convention formality is dispensed with and only your local or district problems will be covered. These meetings have proven extremely beneficial in the past as many watchmakers are seeking just this type of information which

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is seldom brought to the Convention floor due to so many National issues.

The hour and date for this meeting will be announced during the General Convention assembly.

Officers of U. H. A. A. Whose Terms Expire This Month

President—Thomas J. Fagan, Boston, Mass.

Vice President—A. R. Raphael, New Haven, Conn.

Treasurer—Elmer B. Schneider, Toledo, Ohio.

Executive—Ernest Wetteroth, Kansas City, Mo.

Executive — Harold Sabro, Portland, Oregon.

The president, vice president and treasurer terms are for one year.

The two executive terms are for three years.

Proper selection of National officers to guide the destiny of this now great organization is an extremely important matter. Men who have the time and ability to give their fellow watchmakers and this work are the proper men to select. We cannot afford to place in office men who will not fulfill their obligations to all watchmakers, whether they be affiliates or non-affiliates, ours is a work in the interest of the greatest number of our trade.

The destiny of any organization or undertaking depends largely upon proper selection of men to lead and govern our affairs of unified effort.

During the past four years, U. H. A. A. has made progress and this progress must and will continue. The reason for our rapid assent to recognition and success was due to the loyalty of the officer personnel, a body of men pledged to their fellow-men, men who are willing to make personal sacrifices and men who cared not for glory or the song of praise, and finally men who feared not opposition or the many obstacles which are bound to present themselves in many forms to those attempting a work of such magnitude and undertaking.

Choose your officer personnel carefully and wisely. Our every success depends upon your serious consideration and decisions.

Fourth National Convention, U. H. A. A.

Committees Appointed by President

Auditing Committee

Harry Flotermersch, Chairman.....Bellevue, Ky.
H. Sabro.....Portland, Ore.
W. H. Bright.....Boston, Mass.

By-Laws Committee

Joseph A. H. Voss, Chairman.....Cincinnati, Ohio
B. W. Heald.....Milwaukee, Wis.
P. Sommer.....Pittsburgh, Pa.
H. Sabro.....Portland, Ore.
Earl R. Becker.....New Haven, Conn.
H. W. Scheaffer.....Indianapolis, Ind.
J. K. S. Mills.....Boston, Mass.

Resolutions Committee

Frank Foegler, Chairman.....Cincinnati, Ohio
Charles A. Braun.....Weiser, Idaho
E. L. Seibel.....Bridgeport, Conn.
Ernst Peterson.....Denver, Colo.
W. H. Bright.....Boston, Mass.
Richard Meissner.....Racine, Wis.

Nominations Committee Exec.

Ernest Wetteroth, Chairman.....Kansas City, Mo.
Harry Flotermersch.....Bellevue, Ky.
A. R. Raphael.....New Haven, Conn.
F. Foegler.....Cincinnati, Ohio
H. Sabro.....Portland, Ore.

Executive Secretaries Convention Assistants

Orville R. Hagans.....National Executive Secretary
Phil Sommers.....Pittsburgh, Pa.
Richard Meissner.....Racine, Wis.
Elmer Schneider.....Toledo, Ohio

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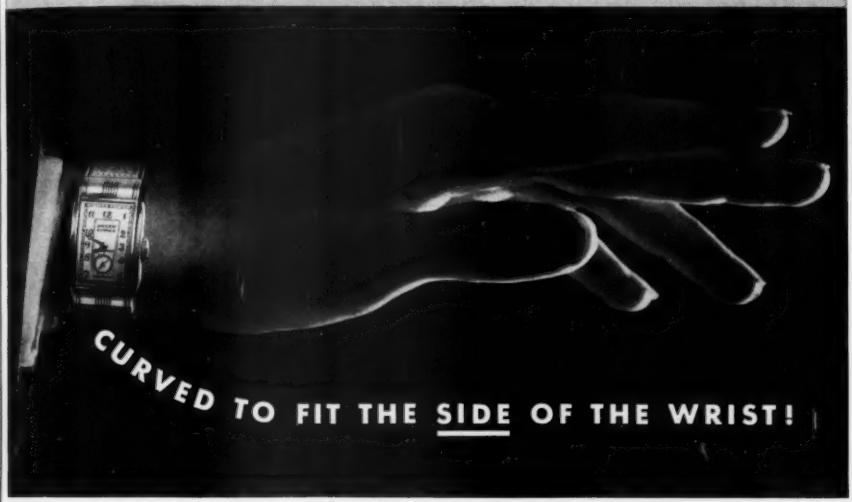

Advantages found in no other watch—Profit Opportunities that are yours exclusively, Mr. Gruen Jeweler!

Check these sensational sales features: **1.** *Direct view;* looks a man in the eye, without effort, without even a twist of the wrist! **2.** *Snug, perfect fit;* can't slip, can't slide! **3.** *Pocket-watch accuracy,* because both case and *movement* are curved to fit the *side* of the wrist! **4.** *Maximum protection against damage;* occupies the one position on a man's wrist that is least liable to be bumped. **5.** *Thoroughly practical;* its attention-value is obvious, but its every feature is, above all, practical!

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GRUEN

The Precision Watch

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THE OLD WAY

. . . flat movement, reduced in size and ruggedness to fit inside curved case.

Remember, **only the Gruen Curvex® has a movement curved, both top and bottom, to fit the curved case.**

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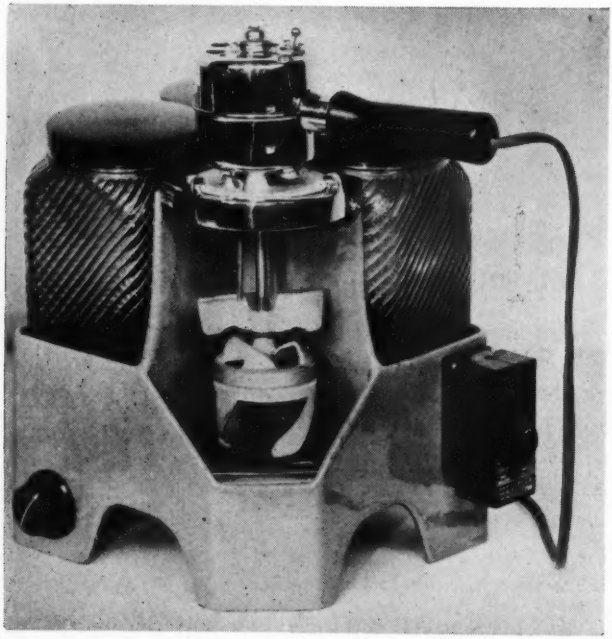
If your jobber does not handle the Superior Watch Cleaner write direct to us for a ten-day free trial.



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has **automatic switch that automatically shuts off heater current after one minute,** eliminating the danger of damage, should you forget and fail to shut off heater current.

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White Gold Timepiece of Jesse James

The timepiece of the notorious horse thief and bank robber of the late nineteenth century is the prized possession of Anshus Brothers, Menomonie jewelers. It is an Illinois make of watch, wound by a key, and it bears the date of 1876. Strangely enough, on this watch is engraved not only the name of its one time owner, but also the theory he lived by. Engravings of knife, rifle, pistol, skull and cross bones, and a picture of himself are on the case. Anshus Brothers have had this watch for about eighteen years and say that it is priceless.

Old Timer Goes Modern

The grandfather clock has gone modern. So much so, in fact, that our venerable ancestors would never recognize it. The face has no numbers, the hands are triangular, and the cabinet is a 20th Century affair of undecorated wood.

Time Does Fly for These Folks

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More than 16,400 calls in a single day is the record now claimed by the Correct Time Service which makes a business of furnishing the time free. Police and the telegraph companies stopped their service some time back and the telephone company charges for it.

Call the service and you will hear something like this: "Take your furniture to the Hozis Repair Co. for best service and lowest prices. The time is 8:42." The caller says nothing—unless "thank you"—and hangs up. The time people have put in their advertising plug, which they sell.

The heaviest demand for service is between 7 and 9 in the morning, but there isn't much difference as to days except that they don't have this morning rush Saturday and Sunday. Ads are limited to 10 words. The service has been operating here for two years.

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Let us refinish the old dial and protect it with a Perm-O-Seal crystal.

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IMPORTED ENGLISH WATCH STRAPS
PLATINUM, GOLD, AND GOLD FILLED CROWNS
MONNAT GENEVA RESILIENT MAINSPRINGS

Odd Clock Designs

By WILL TALSEY

The archives of the United States Patent Office are crowded with models and designs of clocks and hundreds of new sketches come in every year. Many of the models and sketches are unusual in ingenuity and oddity. Recently, one of the strangest of these time pieces came into the patent office, titled as the "Umbrella Clock." The face of the clock is made in the form of a small opened umbrella and the numerals are attached to the rim of the diminutive umbrella. The hands are curved to conform to the contour of the face.

Another procured a patent on a clock that is in the form of a tiny lighthouse. The face of the clock is set in the top of the tower and is illuminated at night. Another inventor waxed patriotic and set the dial and works inside the small model of the Liberty Bell. The bell is a faithful reproduction of the famous relic, even to the spar to which it is fastened and the crack with which every American school child is familiar.

Many of the recent patent submissions are comic in design and are intended primarily to make children "clock conscious." The Humpty-Dumpty clock falls in this group. This is an alarm clock and the funny fellow's hat is the bell. Projecting from each side of the clock is an arm which moves rapidly up and down as the alarm goes off. The "Puppy Dog" clock is intended to intrigue the youthful eye of boys and girls. The face of the time piece is set in the front of a seated dog and a small electric light bulb, which he holds in his mouth, illuminates the dial.

From the many models and sketches submitted to the patent office it seems that much attention is being given to designing clocks and watches with appeal to the children.

The golden rule will bring the golden age to man.

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1. Dependable — experienced workmanship.
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3. A solid, stationary Head built as part of the entire tool — maintains vertical permanent alignment.
4. Removable Punch Bushing in case of wear at this vital point.
5. "On and off" friction to control Punch position.
6. Inverting Punches to provide wide choice of Stumps.
7. "Cut-away" Base allows direct handling of Punches with fingers and makes possible keeping inside of Frame clean, and permits base to be one piece.
8. Designed to provide proper height and ease of handling—Punch and selected die hole are always directly in front of Watchmaker.
9. Complete, correctly tempered, Punch and Stump Assortment.

It must—to be efficient—BE A SINGLE PURPOSE TOOL—Specially designed and built for a life-time of accurate work in its own line.

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Notes On Repair of Synchronous Motored Clocks

EDITOR'S NOTE: With this article we continue the subject of electric clocks which will continue consecutively. The articles to follow are from several authentic sources and will cover construction and service thoroughly.

ARTICLE NO. 3

OVER the past ten years there have been a great number and variety of synchronous motored clocks put on the market. These may be divided into the following types:

A. Manual starting—open train.
   1. With anti-hunting disk.
   2. With no disk.
   3. With staggered rotor.
   4. With movable field section.
B. Manual starting—enclosed train.
C. Self starting—open train.
   1. Full pole cup field.
   2. Subsynchronous cup field.
   3. Subsynchronous field coil and rotor in same plane.
D. Self starting—enclosed train.
   1. Rotor enclosed in gear box.
   2. Rotor not enclosed.

In the first place, it might be well to make a few general remarks, more or less applicable to all types. The main troubles encountered with synchronous motored clocks are as follows:

1. Will not start.
2. Starts but runs slow.
3. Stops periodically.
4. Runs fast.
5. Makes a mechanical noise.
6. Makes a humming noise.

In examining a clock for repair, the first thing to do is to determine which of the above faults are present. The treatment will be determined to a certain extent by the type of motor.

Taking up these faults one by one:

1. First make sure that the clock is getting current, i. e., that the coil and cord are good. A small piece of steel held near the field poles when the current is on will tell this. If not attracted there is no current. This may be due to a faulty cord. If the cord tests all right, the coil must be removed. On certain types, particularly Type C 1 and 2 this is practically impossible. Remedy: Return clock to manufacturer. In others, where the coil can be removed, obtain the correct coil from the manufacturer. Any attempt to use another coil, simply because it happens to fit, is likely to meet with indifferent results.

Having determined that the clock is getting current, it might be well to compare roughly the attraction of the field for a piece of iron with the attraction for the same piece of iron at the same place on the field of a clock known to be good. A noticeable change indicates of course a faulty coil.

Now we will assume that the coil is apparently all right. Still the rotor will not start. This is undoubtedly due to sticky bearings. Clean and re-oil bearings throughout. On Type B, D 1 and D 2, make a small hole in the shell enclosing the gear train (two opposite holes in those which have no breather vent), drain off all the old oil if there is any left, flust out several times with benzine, solder up the new hole made and re-oil. Use a relatively small amount. Most clocks take about a teaspoonful. A white mineral oil is usually used, such as Nujol. This is a little heavy, however, and should be thinned with kerosene. Light animal and vegetable base oils are all right but they will not last as long. Don't put in too much or the power of the motor will be cut down. If the gears seem to whine after you reassemble you probably have not used enough oil. In making the hole, be sure not to get filings inside the gear boxes. A good way is to file a notch in the edge almost through, then punch the thin metal through. Type D 2 always oil exterior end of rotor bearings also.

In cleaning and oiling it may be noticed that bearings, etc., are worn. If so, they will become noisy as soon as the lubricant pounds out. Then it is a question as to whether the rest of the clock is worth the cost of fixing the bad bearings.

Some motors will be found to start

well when the rotor happens to stop in one position and not when it stops in another position. Some motors run inherently this way and others can be corrected somewhat. On every field is a shaded and unshaded section. The shaded section influences the starting and the unshaded the running power. If the shaded section is too strong the motor will run fast. If the unshaded section is too strong the rotor will have points of poor starting. Motors of the Type C 2 and 3 depend on a balance of these two. On some there is provision for changing this balance in various ways, such as moving the weakest pole nearer the rotor, or by shifting the position of the main coil. On others there is no provision for this.

2. Running slow is usually due to binding bearings and can be treated as before mentioned. It is very convenient to use a Neon light for testing motors for synchronism. Use the GE G-10—½ watt size. They are better for this purpose than the G-10—1 watt, or the S-14—2 or 3 watt. When the light is brought near the rotor a pattern will be observed on the rotor. This pattern is not sharply defined and depends on the divisions on the rotor. If there are no distinct divisions on the rotor, such as teeth, spokes, etc., place a small white spot on it either with adhesive tape or paint. Of course this test cannot be used on Type D 1. In this connection, it might be noted that some motors will run at sub-multiple speeds such as ½ speed, and the pattern will appear. It will not look exactly like the right pattern and a check can be made by timing the hands. These sub-multiple speeds are always unstable and for a motor to run at one is the exception rather than the rule.

3. This is an indication of dirt in the train, or iron particles on the rotor. The former is remedied by a good cleaning but since often the iron particles are magnetised they will stick to the fields even though there is no current on. A thorough cleaning and brushing and then a careful inspection will get them out. Motors of Type A are likely to stop periodically if the anti-hunting disk is not working properly. This can be noticed in the difficulty experienced in getting started. A good Type A motor should make ten starts out of ten tries consistently. A fair motor will make at least seven starts out of ten tries. If it only makes five starts out of ten tries there is something wrong, but it may be in the design. Type A 2 are very poor starters as a rule. Type A 3 should have plenty of end motion on the rotor shaft to insure good starting. Type A 1 usually start very well if correctly designed. Some use a spring which pushes one bushing against another, the former holding the rotor and the latter the disk. Too much or too little tension here will spoil starting characteristics.

4. This has been covered in Section 1 and is due to misalignment of the fields.

5. Mechanical noises may be either knocking sounds or gear whine or grind. Knocking usually means lubrication failure and may be corrected with fresh lubricant but perhaps only temporarily since the wear has progressed to such an extent that the lubricant will pound out in a short time and the noise will be resumed. If the fault is simply a dry bearing and there has not been appreciable wear, mere lubrication will fix the clock for a long time. Gear noise is usually due to lack of lubrication but may also be due to wear. This can be determined by inspection.

6. Hum is usually caused by loose iron. Look over the movement for parts which have become loose. Try pressing various parts of the field and see if that stops the hum. Tightening down the field will help. If it appears to be in the laminations an extra hole drilled through and an extra rivet inserted will often help. One way is to soak the laminations in varnish or shellac. Some types of design, particularly Type A 3 have an inherent hum which cannot be removed. Usually these movements are rubber mounted for this reason.

An Open Letter to All Watchmakers

By HENRY GRUSEN

Fellow Watchmaker:

Many watchmakers have prided themselves of being individualists. A good many are that way without being proud. I seriously question the advantage of being locked within ones shell. This observation, as you may guess, is directed to our good fellow watchmakers who, until now, have stood apart from the vast number who are active and alive and happy in the co-operative activities our guilds afford us.

Now, you individualists; let us go into the matter a little further. Were you only reticent or snobbish in the matter of getting together with your fellow craftsmen, that would not be so bad, for, after all, you have your choice in the matter of shaping your own life. But what is bad for you is the fact that you miss a lot of living in many fields of endeavor. If you will check up, objectively, on your daily acts and thoughts, in your shop, in your home, in the street, you will notice that, as an individualist, you are a sponger, a leech, who goes about life receiving courtesies and favors from others, giving little in return.

Do you know what that does to your personality? You are like a light bulb in a box, you have a potential quality for radiation but you are not lighting either your fellow's way or your own. You are stored up with the good feelings of your customer and your neighbor and your own personality is submerged. This does not go on for long. Life grows stale, your friends tire of putting themselves out to please you, you don't like that soon and grow sour on the world. This, in short, is the life history of an individualist.

Now let us supply this thought in relation to those who do not care to become members of the United Horological Association. There can be no doubt that all watchmakers, in and out of the fold, are profiting by the existence of this organization. This publication alone has revolutionized our craft. The laws that are being passed in many states for the good of the craft are benefited equally by members and non-members. It is this moral debt that a non-member owes the organization that could be met. To withdraw into your shell is the poorest way in which you can assist. Individualism is a screen behind which a narrow mind and myopic eye would hide. As an individualist you merely hitch-hike toward the betterment of your trade. Be a Man! Ride to progress like a Man! Pay your Fare like a Man!

This magazine will tell you where to apply for membership near your guild. Do something for it. Improve it by your effort and personality.

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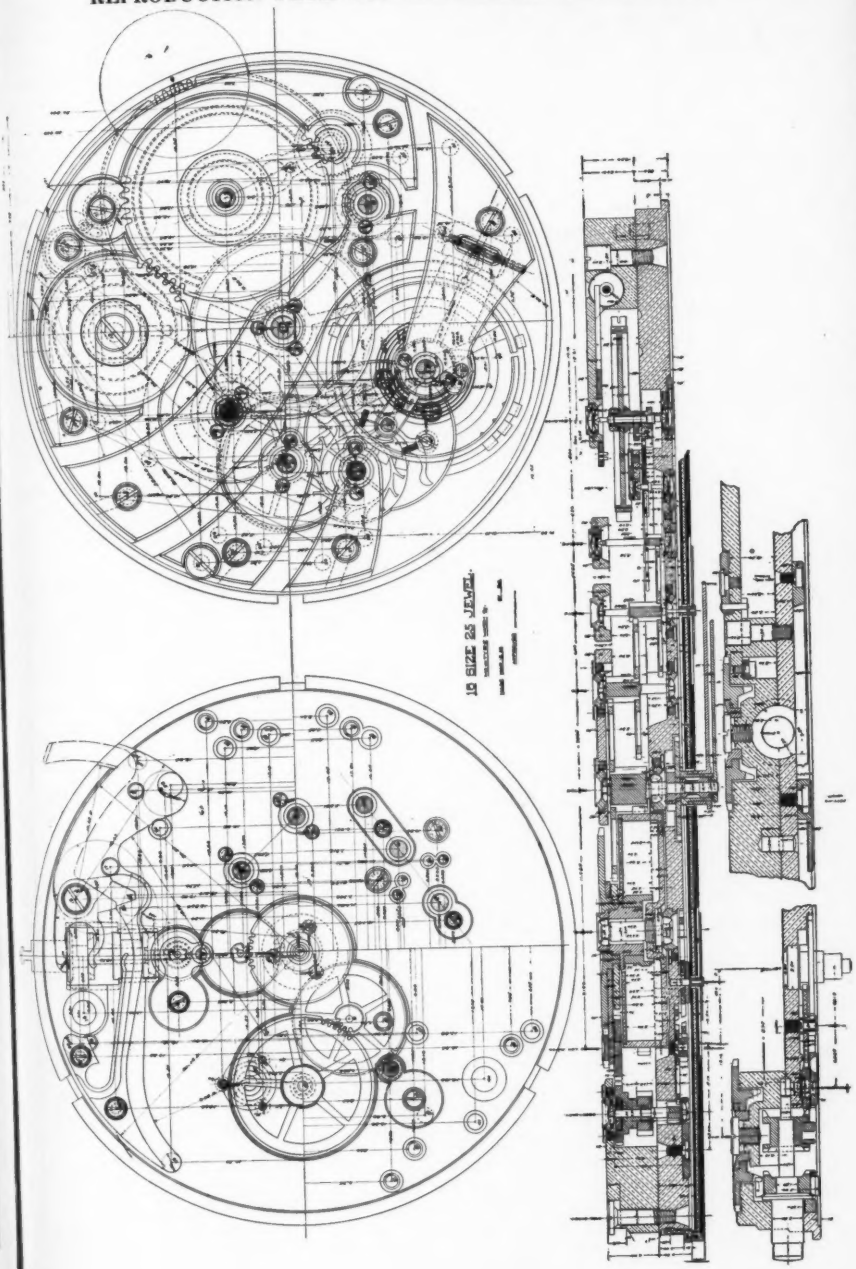


U. H. A. of A. Convention

(Continued from Page 6)

9:30 P. M.—Technical Address by representative of C. & E. Marshall Co.
9:45 P. M.—Technical Lecture by Chas. A. Braun of Idaho.
10:30 P. M.—Recess until Wednesday at 9:00 A. M.

WEDNESDAY, MAY 18

Morning

9:00 A. M.—General Session. Vice Pres. Raphael, presiding.
10:30 A. M.—Report of Nomination Committee.
10:45 A. M.—Technical Lecture by William A. Samelius of Elgin Watch Co. and Chairman of Technical Board of U. H. A. of A.
11:00 A. M.—Address by F. A. Tinkler on Time Inspection.
11:15 A. M.—Address by Wm. D. McNeil, Pres. N. R. J. A.
11:30 A. M.—Technical Lecture by representative of Hamilton Watch Co.
12:00 Noon—Recess.

Afternoon

1:30 P. M.—General Business. Pres. Thomas J. Fagan, presiding.
2:15 P. M.—Address by Orville R. Hagans.
3:00 P. M.—Address and Instructive Talk on Planning State Legislation, by B. W. Heald of Milwaukee, Wis.
3:30 P. M.—Election of Officers.
4:00 P. M.—Selection of Next Convention City.
4:30 P. M.—Adjourn, Sine Die.

Evening

7:30 P. M.—Banquet.
Hotel Statler Ballroom.
Toastmaster.
Address by Mr. I. E. Boucher, Waltham Watch Co.
Address by Fred Gruen, Gruen Watch Co.
Address by Mr. Howard D. Schaeffer, Elgin Watch Co.
Address by Mr. Henry Paulson, Chicago, Ill.
Address by Mr. Wm. G. Swartchild, Chicago, Ill.
Music, Entertainment and Dancing.
All Functions Informal.

MEN AND MATERIAL YOU WILL NOT SEE ON THE 1938 CONVENTION PROGRAM

Lectures on "The Guarantee."

"Watchmakers' Guilds," etc., will not be on the program, as well as many other beneficial and enlightening addresses from prominent men of the trade in over twenty-one cities, as well as all the Naticnal's materials and services.

But, if you wish to hear these men and see these materials, make arrangements to be at the special meeting conducted by Executive Secretary during our National Convention after regular session. You will find yourself at another convention and representation from all sections, their ideas and plans, and what these sections are doing and thinking.

Do not miss this program, where the voices of watchmakers not present will be heard, where all national aids, materials, and future plannings will be seen.

And only at these special meetings after the regular scheduled sessions will you be able to enjoy this opportunity so rarely afforded.

National Conventions deal with issues of the greatest importance, and through necessity are given the major portion of our time.

But many who travel far to attend, wish to hear from others not able to be present. Here is your opportunity to hear them and learn more regarding organization work; how to plan your programs; how to organize; how to retain membership interest; and why interest is being retained.

Facts Revealed by the Last Census

Breadwinners, 47,000,000.
Country's population, 122,000,000.

Average days each work in a year, 275.

Occupied about 75% of the time.

Women gainfully employed, 10,000,000.

Women employed in housekeeping, 23,000,000.

Males between 16 and 64 years old in the country numbered about 38,000,000 and females 37,000,000.

Persons, male and female, over 65 years old number 5,500,000, about 3,000,000 being over 70.

Of males over 65 years old approximately 2,000,000 are gainfully employed in competition with youth.

Of females over 65, one-fourth are employed.

On any given day the greatest number of persons employed on full time is estimated at 40,000,000 to 42,000,000.

Persons engaged in agriculture number 10,000,000.

Persons engaged in mining, 3 per cent. Persons engaged in transportation, 7 per cent.

New Timepiece

Fall River, Mass.

The new $3,223 clock in the B. M. C. Durfee High School tower will be placed in operation next week, Frank B. Tew, temporary engineer employed in the Custodian of School Buildings division, announced today. Mr. Tew, who is in charge of $52,222 repair and renovation project at the high school, said the installation has been practically completed. Workmen are now engaged "wiring up" the clock which has four faces.

The CAS-KER CO.
CINCINNATI, OHIO
Genuine Materials
FOR ALL
AMERICAN AND SWISS WATCHES
TOOLS AND SUPPLIES
formerly
THE AMERICAN SWISS WATCH & SUPPLY COMPANY

MEN...
HERE'S A REAL INNOVATION IN WATCH STRAPS!
KON-ITE
BUCKLE AND KEEPER
The popular Split-Proof TUBULAR Watch Strap steps out with something new — a buckle that cannot corrode, is impervious to perspiration, has no plating to wear off. Made of KON-ITE, a new material of gleaming beauty and exceptional durability. Buckle and keeper come in colors that exactly match the leather strap.
EXCLUSIVE WITH
SPLIT-PROOF
Tubular
WATCH STRAPS
TRADE MARK
See these distinctive straps today AT YOUR FAVORITE JEWELER'S
$1 UP
A. Sauer & Co.
Factory and Main Office
439 RACE ST.
CINCINNATI, OHIO
New York Office
724 FIFTH AVE., N. Y. C.

Matching the Escapement

By OLAF OHLSON

THE term "matching the escapement" is used to designate the work of bringing the different parts of the escapement into correct relation to each other; in other words, to make the necessary moves in order to obtain the proper lock, draft, drop, slide, fork length, let-off, etc. The best way of learning to do this work is to have a competent instructor who is at hand ready to inspect and to give advice. The difficulties are not so great in *doing* this work, as in correctly determining *what* to do, in order to bring about certain results, and also to know when the escapement is in proper condition. It is difficult to give in writing a comprehensive idea of how to do this work. We will, however, give a few points which we hope will be useful to the beginner.

SINGLE ROLLER ESCAPEMENT

FIG. 1

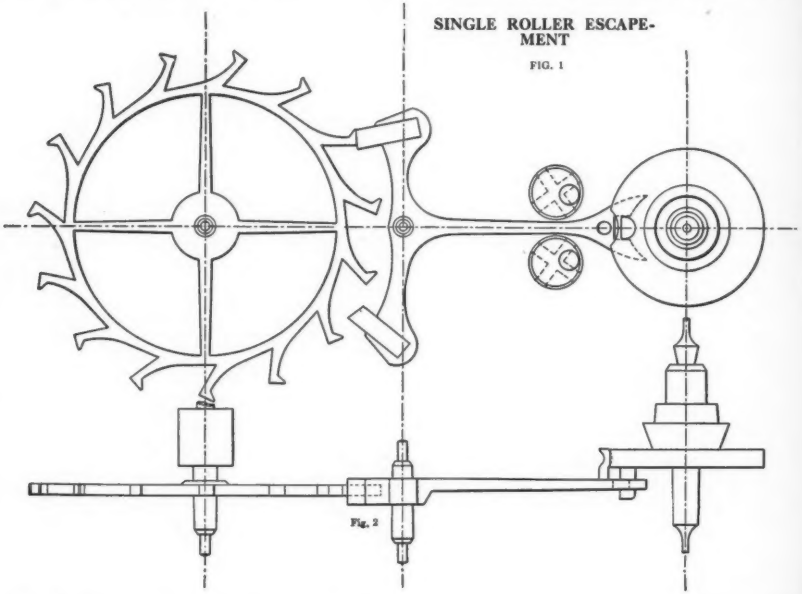
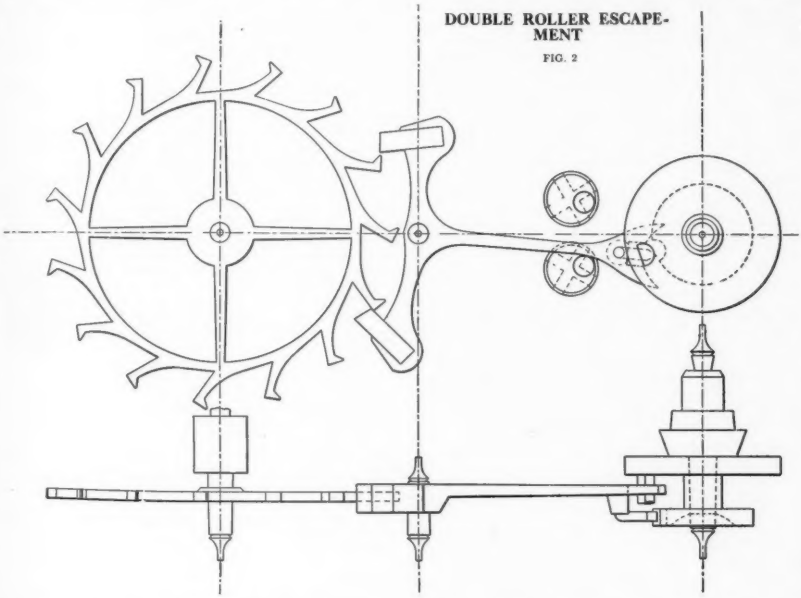


Fig. 2

The first thing to receive attention is the condition of the pivots on the escape pinion, pallet arbor and balance staff, to see that they are straight, and that they fit properly in their respective holes. It is absolutely necessary that each pivot should have *some* side shake, but it is also very important to *guard against too much side shake,* as such an excess causes loss of power and uncertainty in the action of the escapement. A desirable amount of side shake is .01 mm., and it should not exceed .015 mm., and the amount of end shake should be from .02 to .05 mm. As soon as these points have been found to be correct, we are ready to try the "lock" and the "drop." In describing the pallet action, on page 7, we made the statement that the lock should amount to from 1° to 1° 30′. This statement is, of course, of no practical use unless we are equipped with the necessary instruments for measuring this angle. We may, however, use the thickness of the pallet stones for comparison and obtain practically the same results, by making the amount of lock equal to

$\frac{1}{10}$ to $\frac{1}{8}$ the thickness of the stone, from the locking to the let-off corner. This corresponds very closely to the above angular measurements. If the pallet stones are to be moved, in order to change the amount of lock, it is very important to first consider what will be the effect of a certain move, besides the alteration of the lock. The drop, for example, is effected very rapidly by moving the L stone. Hence, if the drops are equal, we should make the change in the lock by moving the R stone. If the lock is too strong, and the drop is larger on the outside, the L stone should be moved. If the lock is too strong, and the drop is larger on the inside, it is necessary to move both stones. Move the L stone out a small amount, and move the R stone in until the lock is correct. It is also well to recognize that the drop may be modified to a certain extent by moving the pallet stones, close to one or the other side, in the slots, as there is always some room allowed for the shellac which is used for holding the stones. The moving of the pallet stones in or out in the slots will also affect the draft feature of the escapement; this is a point which we should bear in mind whenever we make a change in the position of the pallet stones. The effect from moving the R stone out is to increase the draft on both stones, whereas if the L stone is moved out and the R stone in, it will decrease the draft. In order to ascertain that the escape wheel is correct, the lock and the drop should be tried with every tooth in the wheel on both pallet stones. This should be done with the bankings adjusted close, so as to just permit the teeth to drop. And the best way to try this, is to move the balance slowly with the finger while the pallet action is observed through the peep holes. After completing the adjustment of the pallet action, the jewel pin action is next to be considered. The fork should swing an equal distance to each side of the center line when the pallet is banked to drop. If we find that it moves farther on one side than on the other, it will be necessary to bend the fork close to the pallet



DOUBLE ROLLER ESCAPEMENT

FIG. 2

a sufficient amount to bring it in line. This is called, "to adjust the let-off." The test for the let-off is to see that when the pallet is banked to drop, the jewel pin is just as close to the corner of the fork, in passing out, on one side as on the other. This test is correct, provided that the fork is of equal length on both sides of the slot, as it should be. The test for the fork length is that it should allow the jewel pin to pass out on both sides when the pallet is banked to drop. This is the maximum length which is allowed for the fork. The test for short fork is to move the balance so as to unlock the pallet, then reverse the motion and see that the pallet is carried back safely to lock by the jewel pin. This should be tried on both pallet stones. It is however, customary to try the shake of the fork when the center of the jewel pin is opposite the corner of the fork, and not to allow the pallet to unlock from this shake. In order to ensure perfect freedom in the jewel pin action, the jewel pin should be from .01 to .015 mm. smaller than the slot in the fork. The safety action is also adjusted, while the escapement is banked to drop. The guard pin should be made just barely free from the roller when the fork is against the banking, and this should be tried carefully on both sides. If this is done correctly, the roller will have the necessary clearance when the bankings are opened to allow for the slide.

The operation of moving a pallet stone is one that requires a great deal of experience before one is able to do it satisfactorily except by repeated trials. Special tools called "pallet warmers" have been devised for holding the pallet during this operation. In the simplest form this tool consists of a small metal plate, about as large as a 12 size barrel, with a wire handle by which it is held while it is heated. This plate should have one or more holes drilled in it as clearance for the pallet arbor. This tool is provided with a spring clamp for holding the pallet to the plate. The pallet is placed top side down against this plate, and the whole of it is warmed over the alcohol flame until the shellac is softened so the stones can be moved.

A good way of applying shellac for the fastening of pallet stones is to warm some stick or button shellac, over a flame, and pull it out in long threads of about .5 mm. diameter. Shellac in this form is very convenient to use, as it is only necessary, when the pallet is heated to the proper temperature, to touch the end of this thread to it at the place where the shellac is wanted. With a little practice one can learn to deposit just the right amount. After the pallet is cold, all shellac on the surface should be cleaned off carefully with a scraper made of brass or nickel.

Educational and Picturesque Boston, Our Convention City
May 16, 17, 18, 1938

Every man who enjoys the heritage of our glorious America will thrill at the thought of being in Boston during our Fourth National Convention, May 16th, 17th and 18th. Boston, the birthplace of this grand country of ours, will enjoy acting as host to our members and visitors. Boston has expressed their desire to make you comfortable and to see to it that you and all our delegates leave their city with a feeling of satisfaction and desire to again return as their guest.

The Waltham Watch Company is sponsoring a delightful sightseeing trip which will leave the Statler Hotel at 10 a. m. on May 18th. The trip will be to Lexington and Concord. The various stops that will be made are: The Mapparium Room at the Christian Science Church, the Agassiz Museum of Glass Flowers at Harvard, the Hancock-Clarke House at Lexington, and the Old North Bridge at Concord. We will return by the way of Lake Walden and Kendall Green to the Waltham Watch factory where a stop for luncheon will be made. After luncheon we make a visit to the factory and then return to Boston, arriving around 4:30 p. m.

Waltham Watch Company

Waltham watches, created and manufactured in New England, are as well known as our Convention City. More than 28,000,000 Waltham watches have been sold during the last 84 years. But even this gigantic Waltham sales figure is relatively insignificant when compared to Waltham's extensive contributions to the science of watch-making.

Waltham Watch Factory, Oldest Watch Factory In America

The company is exceedingly proud of the great record of the Waltham Watch Company. This company is a world institution and the story behind it is a thrilling one of conquest and victory—of the men who shaped the character of a great commercial enterprise until it resembles in almost every detail the daily struggle of every man to master his own destiny.

To know the story of this company and its struggle for existence in its early years is to realize what can be accomplished by Americans and Horologists. We, today, in Horological Associations are facing a similiar experience and we, too, will succeed and will look back upon our every experience as the Waltham Watch Company has, and with the same pride of their achievements and success.

Be in Boston, May 16th, 17th and 18th, become incensed with the spirit of the pioneers, we are pioneers in this work, many have lead the way, yet like all undertakings, the early pioneers could go just so far as their lives and experience would permit. We Horologists today must carry on to the ultimate success of all previous men; it is our heritage, we must not fail in our work. It is expected of us and we will SUCCEED.

Roaring Clock

Features of a huge clock erected at Messina, Sicily, are a bronze lion 12 feet high, which roars at noon, and a cock six feet high, which crows at sunrise and sunset.

Polar Regions

In the extreme temperatures of the Polar regions, ordinary clocks can be used, if all traces of lubricants are removed.

GREATEST ADVANCE IN
OF STAKING

Reversible Punches

Punches Can Be Inverted in Frame and Used As Stumps

133 PUNCHES

25 OTHER SPECIAL STUMPS

Tested and approved by W. H. Samelius, Technical Editor of American Horologist and Director of Elgin Watchmakers College, and by other leading Horologists and Horological Institutions

PATENT APPLIED FOR

SEE THIS NEW TOOL AT THE CONVENTION IN BOSTON

OUTFIT INCLUDES

PRECISION DRILL PRESS

24 MAGIC PIVOT DRILLS
2 DRILL HOLDERS

Spring Wire Belting, Pulleys and full equipment for operating with power from lathe

The Watch-Craft Staking tool with its extra large die plate of finest alloy steel has 33 ... and 4 slots. It has 4 times the riveting area of other staking tools. The radial arm, mounted ... heavy steel post swings to any position and can be quickly and accurately centered and ... over any hole. Its practical improvements and advantages can be fully appreciated by ... watchmaker. A precision built, up-to-the-minute tool designed for the modern watch repairer ... save his time and make his work easier and more enjoyable. It is the result of years of scien...

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A GREATER VALUE

LARGEST AND FOREMOST...

CENT IN THE HISTORY
AIG TOOLS

WATCH-CRAFT
REG. U.S. PATENT OFFICE . No. 348436

TRI-DUTY

Staking Tool
Precision Drill and
Friction Jeweling Tool

WRITE *for full and complete information. All questions about this new, marvelous tool cheerfully answered. No obligation.*

The finest, most complete and most practical tool of its kind ever built. Nothing in the world to compare with it.

OUTFIT INCLUDES

COMPLETE FRICTION JEWELING EQUIPMENT

12 REAMERS « » 12 PUSHERS
7 FRICTION JEWELING STUMPS

Reamer Holder, Pusher Holder, Micrometer Depthing Adjustment, Built-in Direct Pressure Lever

has 33 ... and experimentation by our technical experts and after many consultations with some of ... mounted ... erica's outstanding practical horologists.
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HOUSTON **CITY**

...HALL CO.
...VALUE GREATER SERVICE

...EMOST HOUSE IN THE WORLD

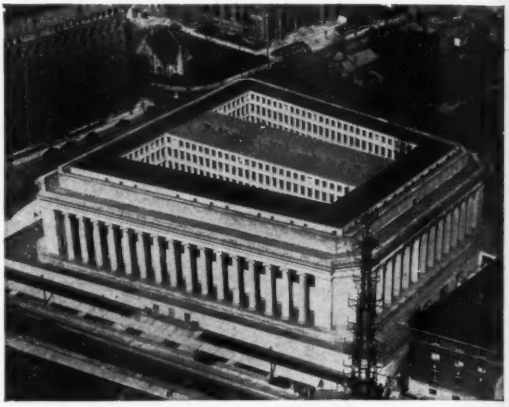
Horological Association of Pennsylvania State Convention Wed. May, 4th 1938

Roosevelt Hotel, Pittsburgh, Pa.

The Pa. State Assn. have arranged for a most interesting and educational program during State Convention.

Every watchmaker within reach of Pittsburgh should arrange to be present during this Convention which we feel sure will aspire you to become more active and interested in our work.

Watchmakers Legislation will be a popular subject as well as many additional enlightening subjects.



Mellon Institute, Pittsburgh

To miss this meeting will be to miss an unusual opportunity to actually hear and see our National Secretary in action. He, we feel is in a better position to give facts and figures than any other man in our trade, and in order that the smallest detail will not be overlooked a major portion of the National's work and service will be available and explained via motion pictures. In addition to pictures and his personal address, there will be available the National Annual report. We will have the privilege of hearing these reports prior to the National Convention as well as many other interesting recorded addresses. Our program is to be as follows:

PROGRAM

Morning 9:00 A.M.—Registration Fee $2 includes Banquet.
10:00 A.M.—Tour H. J. Heinz Co., Food Products, "57 Varieties;" luncheon at noon.
Afternoon 2:00 P.M.—Business Session.

Address of Welcome, President Woolston. Presenting of credentials from accredited delegates to local Secretary.

Adoption of State Constitution and By-Laws.

Nomination, election and installation of state officers.

Next convention date and locality.

Remarks for the good of the organization.

Adjournment.

Industrial Scene, Pittsburgh

Evening—6:30 P.M.—Banquet.

Orville R. Hagans, Nat. Ex. Sec. United Horological Ass'n of America, Inc. Program of vital interest to watchmakers and jewelers, etc.

Drawing for door prizes, Elgin watch, etc.

For additional information contact State Secy., Phil Sommer, 1524 Beaver Ave., N. S., Pittsburgh.

Important Subjects and Resolutions To Be Presented at 1938 Convention in Boston

Resolution No. 1—Use of National Insignia to sustaining and patron members.

Resolution No. 2—Dues, 1938.

Resolution No. 3—Change in membership identification cards.

Resolution No. 4—"Student Membership Guild."

Resolution No. 5 — Establishing the status of the watchmaker.

Resolution No. 6—Executive Boards' report—voting amendment.

Resolution No. 7—Protest Japanese materials.

Resolution No. 8 — Unethical advertising.

Resolution No. 9—Membership campaign materials.

Resolution No. 10—A guide to incumbent and prospective presidents of guilds.

Resolution No. 11—Seal of acceptance.

Resolution No. 12—Regional areas.

Resolution No. 13—Workmanship guarantee certificates.

Resolution No. 14—Change in National Plaque.

Resolution No. 15 — Financing of National Convention.

Resolution No. 16—Watch Inspection Week.

Resolution No. 17—Change in stationery laws.

Other Resolutions are to be presented, but not on file at this time.

Timeology Guild

All watchmakers in the vicinity of the Metropolitan Museum of Art, New York City, New York, are invited to attend the first meeting of Timeology Guild on Tuesday, May 24th, at 8 p. m. sharp, in Classroom A.

This meeting under the supervision of U. H. A. A. Special Representative Mr. Samuel Bernard.

During the first meeting the already formulated Guild will be addressed by National Executive Secretary Orville R. Hagans and other speakers. If you are interested in the advancement of our craft you should be present and partake of the friendly and cooperative spirit which is manifesting itself throughout the country in the Horological industry.

Contact Mr. Samuel Bernard for further information at 4826 47th St., Woodside, L. I.

Pope Pius possesses the costliest watch in the world. It is a jeweled timepiece said to be worth $300,000.

LANDAW BROTHERS
Watch Material and Jewelers' Supplies
406 Clark Building, Pittsburgh, Pa.

NOTICE—ACTIVE MEMBERS

To all active members holding Plaques at this time. If your Plaques are not bearing 1938 plates your plaque lease renewals have not been paid. In compliance with our National By-Laws, all Plaques must be paid in January. Your renewals of $1.00 per calendar year must be forwarded to National Headquarters at once.

If you do not respond to this final request within 15 days, your plaque must be packed up and forwarded to your nearest Secretary or National Headquarters.

TO AFFILIATED GUILDS AND STATES

This order must be carried out without further delay, and you are hereby authorized to replevy of unpaid plaques on or after April 15th.

Affiliated groups are responsible for all National properties and you are expected to fulfill this obligation of replevy or collection of lease fees. No further notice shall be given as all secretaries have received a report on all Plaque holders within your respective districts and states.

ORVILLE R. HAGANS, National Executive Secretary.

Rochester Horological Association

Held a large meeting April 5th, at which time over 200 were in attendance and a great united movement in furthering their organization activities in their state took place.

The state was formulated with Mr. M. E. Pooler as State President, Mr. R. A. Gutfrucht as Secretary and Mr. Albert J. Grohs as Vice President.

At this meeting four additional requests were made for the National Executive Secretary to appear before sectional groups to aid them in the creation of additional guilds. Mr. Pooler, State President, made all of these arrangements, and the National Executive Secretary will comply. Meetings will be held in Buffalo, Niagara, Elmira and Syracuse, in addition to the already scheduled meetings of Rochester and Albany.

Watchmakers of six cities began at this meeting with enthusiasm by winding up the mainspring on what should be a drive for licensing laws. Upwards of 200 repairmen from Rochester, Syracuse, Albany, Elmira and cities between were guests of the Rochester Horological Association at the Powers Hotel at an all day meeting, designed to re-elevate an ancient craft to its one-time peak levels.

Among some of the prominent, nationally known speakers was William H. Samelius, Chairman of the U. H. A. of A. National Technical Board.

From a newspaper clipping we note that a comparison of accurate time was made and that our good friend, Mr. Samelius, was the only man present, who was off time. He was one minute fast. But this is to be expected from Mr. Samelius—he has to be a bit fast. Most watchmakers are slow compared to him and his activity. We feel that the 199 individuals present were one minute slow.

The program for the day and evening was as follows:

PROGRAM

Honorary Introductions

Mr. Jack Stark	Mr. Philip Trevas
Mr. Hy Cohen	Mr. George Scheer
Mr. Abraham Glazer	Mr. Thomas Page
Mr. Al. W. Krueger	Mr. Edward Bauman
Mr. Gordon Levinson	Mr. Lawrence Meredith

Mr. Claude Summerski

Songfest—Under the personal direction of Miss Olivia Martin.

Dinner Music—By Eastman School Trio, under the direction of Miss Muriel Lefkowitz.

Mr. Charles Coster—First President of the Association, "How Our Organization Originated?"

Mr. Martin Weaver—Second President of the Association, "To Succeed We Must Keep Moving Forward."

Mr. Saul Hershberg, "The Importance of an Efficient Shop."

Mr. Russel Scheer, "How the Horological Association Can Help the Jeweler."

Mr. E. L. Sunderlin, "Cooperation of the Jeweler Towards the Horological Association of Rochester."

Mr. Haskell Marks, "The Watchmaker and the Boss."

Mr. R. A. Gutfrucht, "The Advantage of a License."

Mr. Walter G. Lauterbach, "Cooperation and the Elevation of Watch Repair Standards."

Mr. Miles E. Pooler, President, "A Surprise Suggestion."

Mr. W. H. Samelius, Guest Speaker, "Value of Better Watch Repairing to the Store; Need for More Education for Watchmakers" and his moving picture film, "A Trip Through the Elgin Factory" through the courtesy of the Elgin Watch Co.

Watchmakers of New York should contact at once Mr. R. A. Gutfrucht of 890 Main Street, West, Rochester.

Prove Your Appreciation

ARE YOU HAVING TROUBLE

with the oil you are using evaporating and drying up? Most foreign oils are mineral oils and they are bound to evaporate

FULCRUM OIL

WILL NOT EVAPORATE OR DRY UP

Fulcrum Oil does not have a particle of mineral oil in its composition.

A post card request will bring you the booklet "Watch Lubricants, Exposing Their Secrets, Explaining Their Use."

FULCRUM OIL CO. **FRANKLIN, PA.**

Guild No. 2, Horological Association of Massachusetts

Located at Worcester, installed their newly elected guild officers April 5th at St. John's Hall. Clifford N. Barton, President; George N. Emmond, Vice President; Mr. Edward Pogage, Jr., Secretary, and Henry Lanenture, Treasurer.

The Board of Governors also installed Henry J. Perrault, W. B. Herbert, Sr., H. Sigfrid Johnson, Raymond Perrault, Richard Culross and R. O. Jacques.

Mr. Thomas J. Fagan, President of U. H. A. of A., installed the officers, and the following state officers were present from Boston: President William H. Bright, Secretary William Fillebrown, Vice President William Kerrign and Treasurer Louis Swartz.

The guild, composed of twenty-seven local members, is planning a membership drive to enroll all ethical watchmakers of Worcester and Worcester county.

New Initial Watch Attracts Interest at Royal Diamond

At the Royal Diamond & Watch Co., of 340 George street, interest during the past week has centered on the new personalized watch for men and women.

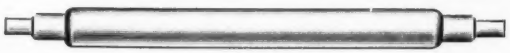
Otherwise known as the initial watch, this wrist watch is slotted both sides of the face to permit placing of initials of the donor and the recipient.

Announced for early release to the public but not yet received is the new Gruen wrist watch for men to fit the side of the wrist. Advertised as the best aid to drivers offered by watchmakers in a decade, it will afford the wearer full view without moving or twisting his hand on the steering wheel.

According to Abraham Weiss, manager of the firm, spring shopping is bringing out the usual seasonal watch buying, besides preliminary skirmishing for prenupital feminine adornment.

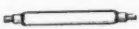
New Model FITRITE SPRING BARS

DOUBLE SHOULDER—"THE BAR THAT WILL NOT PULL OUT"

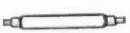


Only 4 Sizes Required Sized as Below

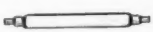
RANGE FROM ½ TO 9/16 INCH



RANGE FROM 5/8 TO 11/16 INCH



RANGE FROM 9/16 TO 5/8 INCH



RANGE FROM 11/16 TO ¾ INCH

Fitrite new model bars are squared on one end, which prevents turning, and aids in holding the bar stationary.

The double end (spring action) shoulder, assures proper fitting, due to the wide range on each shoulder.

ASSORTMENT NO. 60— NEW MODEL

FITRITE

BOTH END ADJUSTABLE SPRING BARS

No. 10.....½ to 9/16 inch | No. 12.....5/8 to 11/16 inch
No. 11.....9/16 to 5/8 inch | No. 13.....11/16 to ¾ inch

CONTENTS 50 BARS

Price $1.40

Separate sizes 35 cents per dozen—Put up one dozen in a FIT RITE Envelope.

FOR SALE BY ALL LEADING MATERIAL DEALERS

M. J. LAMPERT & SONS, Inc.

37 MAIDEN LANE NEW YORK

EXCLUSIVE WHOLESALE DISTRIBUTORS

Portland Watchmakers' Association Portland, Maine

The Portland Watchmakers' Association have held their third meeting, and have forwarded to the National Organization their first applications for membership and affiliation.

This association of watchmakers, supported by the officers of the Maine Retail Jewelers' Association, are rapidly building up a strong state association. Dues are $3.00 per year, and they have already prepared a bill for licensing watchmakers, which will definitely enter the State Legislature in the fall of this year.

All watchmakers in the state of Maine should contact Secretary Edward A. Hendrickson, in care of Blake & Hendrickson, Oak Street, Portland, Maine.

Setting Roller Jewels

By H. W. SCHAEFER

In speaking to different watchmakers I have found that most of them have a lot of difficulty in setting roller jewels and to get the shellac to flow—since I once had the same difficulty—I believe I can help many a workman with this simple suggestion.

I used to use threaded shellac because I wanted the best I could get, as most fellows do. I noticed a great deal of trouble from loose roller jewels, and I asked a druggist friend of mine if shellac lost any of its properties with age. He said he did not think it did, but I bought some flake shellac from him, and when I tried it I was overjoyed to see it flow clear through the hole with very little heat, and I have used it ever since and have no trouble with loose roller jewels. You can buy a handful for a dime.

A very simple thing, but very important to the man who wants his work to hold up. I hope every watchmaker will try this, so I will see no more blue roller tables.

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U. P. Time Inspectors Convention

LOS ANGELES, CALIFORNIA, APRIL 3-4-5-6, 1938

Ohio Watchmakers' State Convention At Cleveland Ohio, March 12, 13, 1938

SECURITY
SWISS MAINSPRING
SYSTEMS

The Spring—

Made of the finest quality cold rolled Swedish Steel, the SECURITY MAINSPRING has long been a favorite of American watchmakers. The new Knife Edge Tip that anchors itself to the barrel hook has added to its popularity, for it saves time and trouble for the watchmaker.

The Cabinet—

The one and two drawer steel cabinets are beautifully finished as imitation mahogany and add to the appearance of any shop. They can be pyramided one upon another and with Newall Unit and Crown Cabinets saving valuable space. Each drawer has plenty of room for expansion using only 72 of the 84 compartments. The Newall Security Cabinets are a decided asset to any watchmaker.

SYSTEM No. 3

System No. 3 contains 144 different bracelet size mainsprings including many for the new baguette sizes. No. 3 in a 2 drawer mahogany finished steel cabinet, complete..... **$29.00**

SYSTEM No. 4

This 2 drawer system contains 144 of the best numbers of bracelet and 12 and 16 size mainsprings selected from the Newall list of 334 mainsprings. Cabinet and springs, complete..... **$29.00**

SYSTEM No. 5

This 1 drawer system contains the best 72 bracelet mainsprings used in No. 4. The 1 drawer steel cabinet and 72 mainsprings, complete..... **$15.00**

Other Newall Security Mainspring Systems are listed in the 1938 Newall Finger print Catalogue. If your Jobber can not supply you with a copy write for a Free Postpaid Copy to

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CHICAGO

The Hour-Glass

Though the cheapness of clocks and watches has banished hour-glasses from the familiar place they once occupied in the daily life of mankind, their general appearance is so well known to everybody as to require no description. This device continues to be depicted by artists, along with the scythe, as the regular attribute of Old Father Time, and it also has other symbolical and decorative uses.

The hour-glass, properly so called, is only one form of the sand-glass, constructed in such proportions that the sand runs through in a single hour. The subject of our gravure is a two-hour glass. Three-minute glasses are still used in the kitchen to time the boiling of eggs. Half-minute glasses are used on shipboard in connection with the old-fashioned log-line, for determining the speed of the vessel. In the Old World sand-glasses are sometimes used to gauge the duration of telephone calls. In the British House of Commons a two-minute glass is turned just before a "division" —i.e., the withdrawal of the voters on the affirmative and negative sides of a question into separate lobbies to be counted—and while the sand is running the "division bells" ring throughout the building to give notice that a vote is to be taken in this manner.

Sand-glasses are designed on the same principle as the common clepsydra (klep-sei-dra), or water-clock, of antiquity, in which time was measured by the passage of a certain volume of water through a small orifice. In the clepsydra various expedients had to be adopted to make the rate of flow of the water independent of the pressure at the orifice, which varied with the amount of water remaining in the vessel. Sand, however, provided it is pure and dry, runs through an opening in the bottom of the container at a uniform speed, regardless of the pressure. In the best hour-glasses silver-white sand is used. Sometimes this is replaced by powdered egg-shell.

Just as the ancients used the clepsydra in their law-courts to limit the time each advocate might speak, so the ministers of Puritan days kept an hour-glass on the pulpit to govern the length of their sermons. They generally considered themselves entitled to the full allowance of time measured by the running sands. Some, indeed, felt no compunctions about turning over the glass and imposing a second hour of spiritual admonition upon their hearers. The use of a two-hour glass, implying an habitual discourse of that inordinate length, was, we hope and believe, unusual.

Old hour-glasses are often enclosed in frames of wood or brass of some artistic merit, and they are occasionally adorned with appropriate mottoes; but neither in the beauty of their designs nor in the variety of their inscriptions do they rival the sun-dial.

—*The Mentor.*

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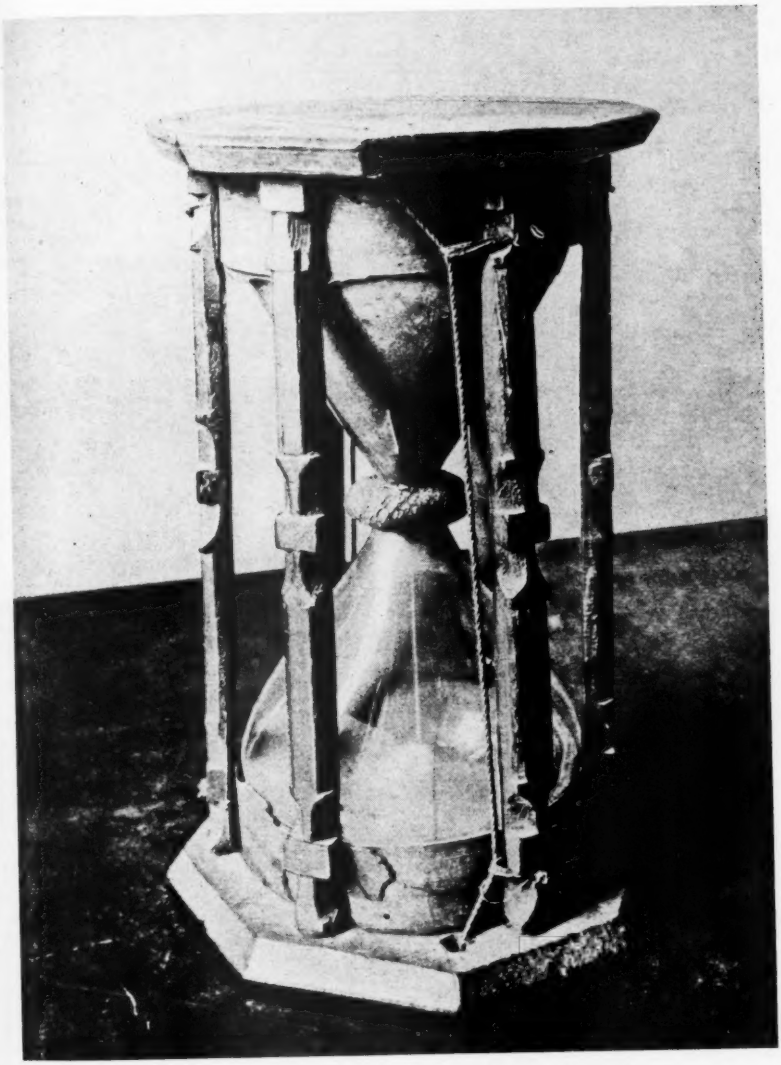

PULPIT TWO-HOUR GLASS—HAND CARVED

In the Essex Institute, Salem, Mass. Art and Beauty Series.

Concerning the Regulator Pins

By HAROLD C. KELLY
Member National Technical Board, U. H. A. of A.

THE condition of the regulator pins play an important part in the position rating of a watch. In fact by slightly opening or closing the pins as the case may require, it is possible to bring the horizontal and vertical position in close agreement.

Let us suppose, for example, that the regulator pins are opened slightly and the first coil of the spring vibrates equally between the pins. We have literally made the active length of the spring longer and the watch will go slower. It also changes the rate between the long and short arcs. The effect can be explained in this way: Supose that the balance is vibrating at an arc of 180 degrees and the first coil of the spring barely touches the pins. For arcs below 180 degrees, the active length of the spring will commence very nearly from the stud. Now, if the arc of motion is increased to 450 degrees, the active length of the spring will be shortened, commencing more nearly from the pins. This will make the long arcs go faster and the effect will vary in proportion to the changes taking place in the arcs of motion.

Suppose now that the pins are open but instead of the first coil of the spring vibrating equally between them, the first coil leans against one of the pins. Assume that it requires an arc of 360 degrees to lift the coil away from the pin against which it leans. It is plain that for arcs below 360 degrees the active length of the spring will commence from the pins; and for arcs above 360 degrees, the active length will commence more nearly from the stud. This condition will make the long arcs go slower, or in other words, opposite to that in the former instance. Thus it can be seen that the condition of the regulator pins may be the cause of many of the disorders in the performance of watches. It is also true that an intelligent manipulation of the pins is the quickest and simplest means of correcting the variation in the rate between the horizontal and vertical positions, owing to the fact that the arc of motion is always shorter in the vertical positions.

The practical use of the regulator pins is stated in the following rules:

If the regulator pins are closed and the watch gains in the pendant up position, a slower pendant up rate is obtained by opening the pins.

If the regulator pins are open and the watch loses in the pendant up position, a faster pendant up rate is obtained by closing the pins.

If the pins are open, the spring should be so adjusted that the vibration of the coil between the pins is equal, otherwise the coil will strike one pin with more force than the other, and the result will be very different from that which is stated in the above rules. Also in spreading the pins the vibration of the coil between them should be very slight and discernable only with a powerful glass. The pins should never be spread more than enough to slow the mean rate three seconds an hour. If spread beyond this amount the watch is apt to become a very unreliable time-piece; in other words, position adjustment by means of the manipulation of the regulator pins can be practiced only to a limited extent.

Let us now consider a few examples taken from actual practice.

Problem 1.

Watch—16 size, 23 jewels.
Repairs—cleaned staff fitted, balance poised.

After cleaning and repairing the watch was tested in three positions and it was found to have variation of fifteen seconds with a gain in the pendant up position shown as follows:

Dial up	— 6	—6	
Dial down	—12	—6	
Pendant up	— 3	+9	(15)

An examination showed that the balance spring was level and pro-

centered and that the regulator pins were tightly closed. Accordingly, the pins were spread slightly and after timing by turning in two opposite timing screws, the test in position was again tried, this time with the following results:

Dial up	—2	—2	
Dial down	—5	—3	
Pendant up	—9	—4	(2)

Problem 2.

Watch—16 size, 7 jewels.

Repairs—Cleaned, main spring fitted.

The first test showed a variation of twenty-eight seconds as shown below:

Dial up	+ 8	+ 8	
Dial down	+15	+ 7	
Pendant up	+48	+33	(28)

The error being considerable, it was reasoned that the balance was out of poise. The spring was removed and the balance was tested for poise. A slight poise error was found but the want of poise could not be responsible for the whole variation of twenty-eight seconds. Therefore in addition to poising the balance the regulator pins were spread slightly and after timing the watch, the next test showed a much improved rate:

Dial up	+3	+3	
Dial down	+6	+3	
Pendant up	+5	—1	(4)

Problem 3.

Watch—16 size, 17 jewels.

Repairs—Cleaned.

This example showed a loss in the pendant up position instead of a gain as was found in the previous examples.

Dial up	— 2	— 2	
Dial down	— 4	— 2	
Pendant up	—18	—14	(12)

As the watch was in excellent condition throughout, the error was most likely to be found in the regulator pins. An examination showed that the pins were open and the correction consisted of closing the pins. A much improved rate is shown in the second test as follows:

Dial up	—1	—1	
Dial down	—2	—1	
Pendant up	—5	—3	(2)

C. & E. Marshall Introduces the Greatest Advancement In Staking Tool History

(See it at the convention in Boston!)

A Watch-Craft Staking Tool, Precision Drill and Friction Jeweling tool combined. Instead of a moving die plate which has to be set each time it is used, it has an extra large accurate solid die plate fastened securely to a six and one-half pound base—a very solid foundation for all riveting work and just the proper height for convenient use. The die plate is extra large with four times the riveting area of any other staking tool on the market. It is made of the toughest alloy steel known to science and is accurately hardened. Dull chrome finish to prevent rust and tarnish. This specially made die plate has two rows of holes and four slots designed to take care of all special and regular work. The holes range in size from .010 to .185. Special chamfered holes are provided for closing collets, cleaning hour hands, etc. A key slot is provided for staking single roller.

A special radial arm mounted on a heavy solid steel base swings to any position and can be quickly centered and locked over any hole. It is provided with friction sleeve guide for punches, also extra guide to accommodate drills and friction jeweling reamers and punches.

All punches are reversible and can be inverted in the base and used as a stump which makes possible a very wide range of work. Watch-Craft punches and stumps are made of the finest quality steel and correctly hardened for the particular work they are designed for. Each one is individually turned out by hand, hand finished, lapped and polished on the face to a mirror finish.

In addition to the special new staking tool features, the Watch-Craft Tri-Duty tool is equipped completely for Friction Jeweling. All reamers, punches, stumps, etc., are supplied and have their regular place in the cabinet. The tool has an accurate micrometer adjustment so that

the jewel can be set at just the proper depth in plate or setting for proper end shake.

The drilling attachment is an innovation that every watchmaker will appreciate as it combines a new feature for saving work, time and making hard, disagreeable jobs simple and easy. Pivot drilling, holes in plates, removing broken screws, attaching dials, etc., can be done with more accuracy and precision than in a lathe. Twenty-four pivot drills are supplied with this outfit, a regular place for them being provided in the cabinet.

Any experienced watchmaker can quickly see the time and labor-saving advantages of this new, all inclusive tool. Other tools are practically the same as they were ten or twenty years ago. The Watch-Craft is built to handle all work on new, modern watches, small and large, as well as all of the older models, and not only handles the work, but handles it with ease, with accuracy and precision.

A precision built, up-to-the minute tool designed for the modern watch repairer—to save his time and make his work easier and more enjoyable. It is the result of years of scientific study and experimentation by Marshall technical experts and after many consultations with some of America's outstanding practical horologists.

The Watch-Craft Tri-Duty Staking Tool — Friction Jeweling Tool — and Watchmaker's Drill has earned the recommendation of preeminent leaders—horological authorities whose judgment and opinions are held in highest esteem by everyone in the industry.

Made in America in the C. & E. Marshall Company Factory—by men who are practical watchmakers and who take pride in producing the finest tool of its kind ever built. An illustration of the tool can be found on page ??. It sells complete with all equipment for $98.50 and can be had for $9.85 a month for 10 months.

A. H. SAUER, JR., APPEALS DECISION INVOLVING WATCH STRAP PATENTS

Albert H. Sauer, Jr., of A. Sauer & Co., Cincinnati, Ohio, whose United States District Court suit involving two patents on watch straps was decided last December in favor of Cowen Bros., 40 John St., New York, has appealed the decision to the United States Circuit Court of Appeals.

Following the signing of the order and petition allowing appeal, Federal Court Judge Robert P. Patterson on March 18, issued a citation ordering Cowen Bros. to appear before the United States Circuit Court of Appeals for the Second District, on April 16, to show cause why the final decree in this action should not be corrected.

The appeal is based on the claims that the court had erred in several respects when finding in favor of the defendants. At the outset it is maintained that the judge was in error when holding that the plaintiff's design patent No. 98,189 was invalid and void and also when failing to decree that this design patent has been infringed. Concluding, Mr. Sauer asks that the decree be reversed and that the court direct a decree be entered holding the design patent valid and also that the plaintiff be granted an accounting and damages alleged to have been suffered by reason of the alleged infringement of his rights.

The Horological Association of Virginia, Norfolk, Virginia

The Horological Association of Virginia held a Supper Meeting, Tuesday Evening, April 5, 6:30 p. m., at Brown's Restaurant, 321 Granby St., Norfolk, Va.

Nominating Committee composed of L. R. Hackman, H. C. Denlinger and D. W. Gaskins and a Legislation Committee composed of W. Camp Shelly, Richard V. Bailey, John B. Hawkins and Theron O. Sowers were appointed by the president.

Mr. Louis Waldman gave an interesting talk on figuring diameters of wheels and pinions.

Watch Factory On 24-Hour Week To Prevent Shutdown

Another curtailment in working schedule, to 24 hours, three days a week, has been announced effective from now until further notice, at the Waltham Watch Company. The factory will operate Mondays, Tuesdays and Wednesdays. For several weeks now a four-day schedule has been in operation.

The further reduction is reported due to business conditions. The shorter week has been designed in order to keep the plant operating on a regular basis, rather than allowing production to so far proceed that a complete shutdown would be necessary.

Time Saving Does It, Admits Magician

Magician John Mulholland pulled a fast one and showed Rochester how to save time.

"Just put it in the bank," he advised, and deftly slipped five alarm clocks through a slot.

He showed how to spend time, too. Bringing his bag of tricks and his smooth line of patter to Rochester for the fourth time, he entertained the Ad Club members at their weekly luncheon.

"See, I've plenty of time," he said, showing his old-fashioned gold watch. He rubbed it against his palm and pfft —it vanished. Members gasped.

"Whether it's daylight or standard, magicians are an authority on time," he remarked. "If we didn't handle timing to the split second, you would see through our best tricks."

One after another, the tall, black-haired magician paraded his stunts, some as the Chinese did them 2,000 years ago, others as he has perfected them himself.

Solemn-faced and smooth, he fitted a story to each trick.

Emerald Mine

SPRUCE PINE, N. C.—Reopening of the only emerald mine known to exist in the South is planned by the Crabtree Mining Corporation, Edward Fortner, of this town, announced today.

Fortner, who with B. C. and J. P. Grindstaff has purchased the old emerald mine 15 miles south of here, said that water which now fills the 250 foot shaft will be pumped out as soon as weather conditions permit opening of a road to the property.

The mine was in operation for several years until 1900 when it was abandoned. Revived interest in precious stones led the Spruce Pine men to buy the place last year. Prospecting at that time revealed large quantities of emeralds, all of them small stones. Fortner submitted those specimens to a Tiffany expert who advised him that they were of good quality but too small for valuable cuttings. Since geologists say that emeralds usually increase in size as mines get deeper, the Crabtree company is planning to deepen the shaft, believing valuable stores will be found at lower levels.

Precious and semi-precious stones of almost every kind are found all through this region, but usually they occur in deposits of feldspar, mica and kaolin, where they are regarded as a nuisance. Almost every refuse heap of a nonferrous mineral mine is a mine of miniature gems in itself. Sometimes, however, large and valuable pieces of stones are found, but such discoveries are too sporadic to figure in commercial mining.

The emerald mine, however, will be operated solely for these green gems. The only other place where precious stones are mined commercially in North Carolina is at an amethyst pit in Macon County.

21 Years Service

Watchmakers' Supply House, Inc., of Wilkes-Barre, Pa., David Charnowitz, President, celebrating twenty-one years of service to the trade since its founding in 1917, marks the event with the publication of an attractively illustrated circular of features and price specials from its line. The bulletin which is being distributed to a large mailing list will be sent out monthly.

As one of the oldest and largest importing and jobbing houses in Northeastern Pennsylvania, Watchmakers' Supply has enjoyed a steady growth over an ever-enlarging field during the past two decades. With an optimistic view toward future business development, increased expansion and added facilities are planned for the buying convenience of old and new friends throughout the area which it serves.

The British lines, Queen Mary, carries 596 clocks. They are controlled electrically by two master clocks on the bridge.

The Wisconsin Watchmakers Association

Wisconsin Watchmakers are recognized as leaders in their field and with the requirements, now set forth by law, will undoubtedly be the finest in the U. S. A.

Standards of workmanship established by the State Board of Examiners protect the public against the incompetent and unscrupulous, who prey on the unsuspecting public.

The Watchmakers' craft is every day becoming a finer art. Smaller and smaller watches require finer workmanship and skill.

Watch Crystals

The Dutcher Brothers have placed a new product on the market known as PERM-O-SEAL Crystals.

These crystals are truly beautiful, with the clarity of pure water.

They are electrically sealed, eliminating seepage of dust or moisture, are unbreakable and guaranteed for a year unconditionally. The material contains no celluloid or damaging properties.

For those wishing to render a finer type of crystal service to their customers, use PERM-O-SEAL.

Notice

To Wisconsin Registered Watchmakers:

The attention of this Board has been called to the advertising and soliciting of watch repairing by so-called trade watchmakers outside of the State of Wisconsin.

Section 125.08 (4) Wisconsin Statutes prohibits "employing, directly or indirectly, any unregistered watchmaker to perform any watchmaking." Persons sending watches for repair to any concerns not employing Wisconsin Registered Watchmakers are subject to criminal prosecution and revocation of their Certificates of Registration as Watchmakers. Registered watchmakers, who are employed by persons violating Chapter 125, are subject to the same penalties, if they continue in the employ of such violators.

No further notice or warning will be given. It is our hope that prosecution for violation of this section will not become necessary.

Respectfully yours,
WISCONSIN BOARD OF
EXAMINERS IN WATCHMAKING.

Horological Association of Massachusetts

The Horological Association of Massachusetts held its regular meeting at the Hotel Statler in Boston, Wednesday, April 13. The meeting was very well attended not only by regular members of Boston, but also by many from the two newly organized Guilds as well as several of the wholesale and material men of Boston.

The guest speaker of the evening was Mr. Walter J. Kleinlein of the Waltham Watch Company, his subject was "Advantages of Organization." He gave a very interesting resume of several watchmakers associations and societies thruout the country. It is always interesting to hear about the methods that others are using.

The Extension committee of the Boston group look back on their accomplishments with great satisfaction.

The following reports come in from the two newly organized Guilds:

Guild No. 3 of the North Shore

At the first regular meeting of the North Shore Guild, which was held on April 11 in Salem, Massachusetts, National President Thomas J. Fagan installed the following officers: President, Charles H. Mueller; Vice President, George Williamson; Secretary, Joseph R. Richard; Treasurer, Harold L. Cottle; Executive Board, Henry L. DesJardins, George Todd, A. A. Mattson, Charles E. Bisset, Chester W. Cook, William E. Blanchard; Trustees: 1 year, Arthur Stearns; 2 years, Richard M. Cook; 3 years, John J. Aylwin.

W. P. FILLEBROWN,
Secretary.

Patronize Our Advertisers

An Adjusted Watch

(Continued from Page 12)

equal. It is practically impossible, especially with the ordinary brass and steel balance wheel and steel hairspring, to reduce the variation of rate with temperature to a linear (straight-line) function, and at the same time keep the change of rate small. Consequently, with a given balance wheel and hairspring, practically all that can be done is to make the rate at high temperature equal the rate at the low temperature and to let the rate at the medium temperature be what it may. The adjuster, therefore, is chiefly interested in the difference between the rates at the high and low temperatures, and in the general slope and flatness of the curve, while the wearer of the watch is concerned only in knowing what the rate of the watch is at the various temperatures.

Equalizing long and short arcs. — When the temperature adjustment is satisfactory, the balance is then poised, the hairspring put on and adjusted to equalize the time of the long and short arcs of the balance. When the watch is lying in the dial up or dial down positions the balance is supported by one pivot mainly and will make a long vibration say of one and one-half turns (540 degrees). When it is placed in any vertical position the balance is supported by both pivots and the greater friction will reduce the vibrations to a shorter arc of about one and one-quarter turns (450 degrees). These are called the long and short arcs and it is likely that the short arcs will take more time to complete their vibrations than the long ones. The long and short arcs of the balance can be equalized as to the length of time taken in making their vibrations by a slight change in the shape of the overcoil of the hairspring.

To test the long and short arcs, the rate of the watch is noted after a run of 24 hours in the dial up position. It is then rated in the 3 up and 9 up positions for 24 hours each. These two vertical positions are rated to eliminate errors due to the balance not being in perfect poise. The rates might be as follows:

Dial up + 4 seconds per day.
3 up + 13 seconds per day.
9 up — 5 seconds per day.

In this case the watch with 3 up is 9 seconds faster than with dial up, and with 9 up it is 9 second slower. The mean of the two vertical rates is + 4 seconds which equals the dial up rate. This shows that the long and short arcs are equal and that the difference between the 3 up and 9 up positions is only a question of poising the balance by adjusting the quarter screws.

The rates will more likely be something like the following:

Dial up + 4 seconds per day.
3 up — 3 seconds per day.
9 up — 12 seconds per day.

In this case the watch with 3 up is 7 seconds slower than with dial up, and with 9 up it is 16 seconds slower. The mean of the two vertical positions is — 7½ seconds as compared with correct time and shows that the short arcs are 11½ seconds slow as compared with the long arcs, dial up position.

The correction is to slightly alter the form of the overcoil of the hairspring to make it more flexible which will quicken the short arcs.

The overcoil curve differs somewhat in each watch due to the fact that the friction at the pivots varies, balances may have long or short staffs, and the escapements differ, so that the final adjustment of the overcoil must be made to suit each individual watch. This refers to the final adjustment of the overcoil to cause it to open in a direction opposite the direction in which it is pinned into its collet to quicken the short arcs and the reverse of this procedure in order to slow down the time of the short arcs if this should be necessary.

For a theoretical balance having all its weight in its rim, no friction at its pivots, and not connected in any way with an escapement, a mathematician can chart an overcoil for a hairspring that will make the long and short arcs equal in time. A great number of these curves,

in several designs, have been charted and printed and many watchmakers have used them as models in the belief that they solve a problem, but as the theoretical balance is impossible in practice so is the theoretical overcoil curve.

The overcoil spring must also be adjusted carefully in the eye and if not true it will not only look bad but it will not time well. When the spring is true in the eye the coil about midway between the eye and the outer coil will apparently stand still. When this middle coil is seen to jump or shake the eye is not true. (An excellent article on the Practical Manipulation of Hairsprings, by Howard Beehler, of the Hamilton Watch Company, appeared in the June, 1936, issue of THE AMERICAN HOROLOGIST.)

For one cause or another the watchmaker is often called upon to replace a hairspring in a good watch and there is no reason why he should not re-adjust it and turn it out a credit to himself and to his profession if he will but take the time and trouble. Sometimes rust eats into the spring and causes the watch to lose at a gradually increasing rate, or perhaps it has been damaged by a careless workman or by the wearer. Many good watches are taken from shop to shop until a workman is found who has pride in his profession and will take the time and trouble to re-adjust it. Many others are laid aside and watchmakers condemned as tinkers.

Adjustment to positions. — When the mean of the short arcs equal the lying rate the positions are corrected by rating the watch with 12, 3, 6, and 9 up. A loss in any of these positions shows that the upper part of the balance in that position is heavy. The upper timing screw in that position is turned in a little or the lower one turned out a little. In this way the position rates can be adjusted to be fairly equal in all of the vertical positions, provided that there are no escapement faults which would cause errors of their own.

From the foregoing it will be seen why a watch that has had an accident necessitating the replacement of the balance staff or hairspring is no longer an adjusted watch unless the watchmaker who has it in hand is capable and conscientious enough to re-adjust it.

Adjustment for isochronism. — This adjustment depends on several factors: the nicety of the adjustments of the entire watch in manufacture; the equalization of the long and short arcs of the balance through the manipulation of the hairspring, and the fitting of the proper mainspring for the watch. These factors are of equal importance and a deficiency in any of them is destructive to this adjustment.

The test for isochronism, or the uniformity of rate as the watch runs down, is determined from readings taken every hour or two during the first 36 hours after winding, the timepiece being wound only at the beginning of the test. In the National Bureau of Standards, watches are tested in the vertical, pendant-up, position as that is the position in which they are generally carried, and therefore the position in which isochronism is of most importance, although a nearer

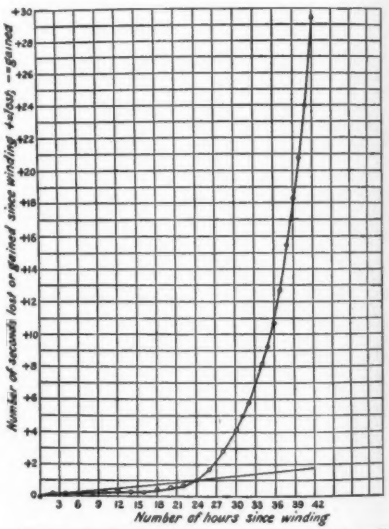

Figure 2—Isochronism curve of a watch well adjusted for isochronism for the first 24 hours after winding, with only small errors during that time, but showing a marked change in rate after 24 hours.

approach to true isochronism can usually be obtained with the watch in the horizontal position. Although a fair isochronism adjustment can be expected only for the first 24 hours, the test is conducted for the longer period to show more clearly the changes in rate that may occur after 24 hours. Any attempt to secure isochronism for more than 24 hours usually results in the sacrifice of isochronism for the first part of the run.

Figure 2 is a graph of the isochronism curve of a watch that is well adjusted for isochronism for the first 24 hours after winding, with only small errors during that time, but showing a marked change in rate after 24 hours. The character of the variations after the first 24 hours depends largely upon the methods used to secure isochronism.

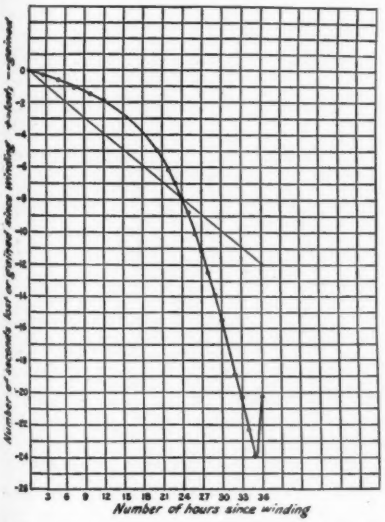

Figure 3—Isochronism curve of a watch poorly adjusted for isochronism and exhibiting a steady increase in rate after the 24-hour point except for a reversal of rate in the last hour before the watch stopped.

For some timepieces the rate continues in the same direction as during the first part of the test but increases rapidly, while for other timepieces there is a sharp reversal of rate within a few hours after the twenty-fourth. The rate as the spring runs down often increases to several times the earlier rates.

Figure 3 is a graph of the isochronism curve of a watch poorly adjusted for isochronism and exhibiting a steady increase in rate after the 24-hour point except for a reversal of rate in the last hour before the watch stopped. A straight line drawn from the zero point through the 24-hour point of the curve is taken to represent true isochronism for the observed 24-hour rate. In the Bureau of Standards tests the isochronism error is taken as twice the error at the 12-hour point subtracted from the error at the 24-hour point.

Bureau of Standards test for fully adjusted watches.—In Table 1 is shown the test designed for high-grade pocket watches adjusted for five positions, three temperatures, and for isochronism and is the most complete scheduled watch test conducted by the Bureau.

Computation of derived results.—The derived results are computed in accordance with the following rules:

1. The "mean deviation of daily rate" is the mean, regardless of sign, of the 48 differences obtained by subtracting each of the 48 daily rates of the 14 periods of the test (period 11 being omitted) from the mean rate of the period in which the daily rate occurs.

2. The "mean deviation of rate for change of position" is the mean, without regard to sign, of the differences between each of the "mean rates" for the five positions and the algebraic mean of the five. The "mean rate" for each position is the average of the mean daily rates for the two periods in the same position.

3. The "largest difference of rate between any two positions" is the largest difference between any two of the "mean rates" for the five positions. (Periods 1 to 10.)

4. The "rate in horizontal, dial-up minus the rate in vertical pendant-up position" is the difference between the "mean rates" for these two positions taken as indicated.

5. The "rate in horizontal, dial-down minus the rate in horizontal, dial-up

position" is the difference between the "mean rates" for these two positions, taken as indicated.

6. The "progressive change in rate in periods 1 to 10" is the algebraic mean of the differences between the mean rate for the first period of the test in each position and the mean rate for the second period in the same position. It indicates the progressive change in rate which has taken place during the position tests.

7. The "recovery of rate" is the difference between the mean rate in period 15 and the mean rate in period 1.

8. The "isochronism error" is the difference between the amount gained or lost in the isochronism test, period 11, in the first 24 hours after winding, and twice the amount gained or lost in the first 12 hours after winding.

9. The "difference in rate per degree from 5° to 35° C." is the difference between the mean rate in period 14 and the mean rate in period 12 divided by the difference in temperature in ° C. for the same two periods.

10. The "difference in rate per degree from 5° to 20° C. minus the difference in rate per degree from 5° to 35° C." is the difference between the two rates, taken as indicated. The difference in rate per degree from 5° to 20° C. is the difference between the mean rate in period 13 and the mean rate in period 12 divided by the difference in temperature in ° C. for the same two periods.

This criterion shows the uniformity of the change in the daily rate with temperature. This quantity, when averaged without regard to sign, with the result obtained in criterion 9 serves as a joint measure of the temperature compensation, and is used as the term c in the formula for calculating relative performance.

11. The "largest mean daily rate for any period" is the largest mean rate for any of the 15 periods, omitting the isochronism test, period 11.

TABLE NO. 1

Period	Duration	Position	Temperature
1	3 days	Vertical, pendant-up	28° to 30° C. (82° to 86° F.).
2	do	Vertical, pendant-right	Do.
3	do	Vertical, pendant-left	Do.
4	do	Horizontal, dial-up	Do.
5	do	Horizontal, dial-down	Do.
6	do	do	Do.
7	do	Horizontal, dial-up	Do.
8	do	Vertical, pendant-left	Do.
9	do	Vertical, pendant-right	Do.
10	do	Vertical, pendant-up	Do.
11	36 hours	Vertical, pendant-up (isochronism) (Intermediate day.)	Do.
12	5 days	Horizontal, dial-up (Intermediate day.)	5° C. (41° F.).
13	do	Horizontal, dial-up (Intermediate day.)	20° C. (68° F.).
14	do	Horizontal, dial-up (Intermediate day.)	35° C. (95° F.).
15	3 days	Vertical, pendant-up	28° to 30° C. (82° to 86° F.).

Derived results and tolerances.—

No.	Criteria	Tolerance allowed Seconds
1	Mean deviation of daily rate	0.75
2	Mean deviation of rate for change of position	3.00
3	Largest difference in rates for any two positions	10.0
4	Rate in horizontal, dial-up positions minus rate in vertical, pendant-up position	5.0
5	Rate in horizontal, dial-down position minus rate in horizontal, dial-up position	4.0
6	Progressive change in rate in periods 1 to 10	3.00
7	Recovery of rate	6.0
8	Isochronism error	3.0
9	Difference in rate per degree from 5° to 35° C	.20
10	Difference in rate per degree from 5° to 20° C. minus difference in rate per degree from 5° to 35° C	.30
11	Largest mean daily rate for any period	10.0

TABLE NO. 2

Period	Duration	Position	Temperature
1	2 days	Vertical, pendant-up	20° C. (68° F.).
2	do	Vertical, pendant-right	Do.
3	do	Vertical, pendant-left	Do.
4	do	Horizontal, dial-down	Do.
5	do	Horizontal, dial-up	Do.
		(Intermediate day)	
6	do	Horizontal, dial-up	5° C. (41° F.).
		(Intermediate day)	
7	do	Horizontal, dial-up	35° C. (95° F.).
		(Intermediate day)	
8	do	Vertical, pendant-up	20° C. (68° F.).

Derived results and tolerances.—

No.	Criteria	Tolerance allowed Seconds
1	Maximum difference in daily rate for any two positions	12.0
2	Difference in daily rate between dial-down and dial-up positions	5.0
3	Maximum difference in daily rates for any two temperatures	8.0
4	Recovery of rate	4.0
5	Regulation	7.0

This is the Class A test but there are other tests made by the Bureau as follows:

Class B test.—Designed for pocket watches which are adjusted for three positions and three temperatures, and is less exacting than the Class A test.

Railroad precision test.—Designed for pocket watches of high grade, generally designated as five-position adjusted railroad watches, and is somewhat less exacting than the Class A test, but more exacting than the Class B test. This test is shown in Table 2.

Computation of derived results.—The derived results are computed in accordance with the following rules:

1. The maximum difference in the mean daily rates of any two of the first five periods.

2. The "difference in daily rates between dial-down and dial-up positions" is the difference in the mean daily rates for periods 4 and 5.

3. The "maximum difference in daily rates for any two temperatures" is the maximum difference in the mean daily rates of periods 5, 6, and 7.

4. The "recovery of rate" is the difference in the mean daily rates for periods 8 and 1.

5. "Regulation" is the mean daily rate in the vertical, pendant-up position, period 1.

Certificates and reports.—A certificate is issued for each watch which does not exceed any of the tolerances in this test. A report is issued for each watch which exceeds one or more of the tolerances. The certificate or report shows the mean daily rates for each of the eight periods of the test and the computed values of the above criteria.

Business precision test.—Designed for ordinary commercial pocket watches, designated as three-position watches, and is less exacting than any of the above tests.

In addition to the above tests the Bureau has standard tests for stop watches and ship chronometers.

The illustrations and much of the text in this article is from Circular 392 of the National Bureau of Standards, entitled "Testing of Timepieces," by Ralph E. Gould, Chief of the Time Section. The booklet contains much information on the subject covered and other pertinent information. It may be procured from the Superintendent of Documents, Washington, D. C., price fifteen cents.

—D. L. T.

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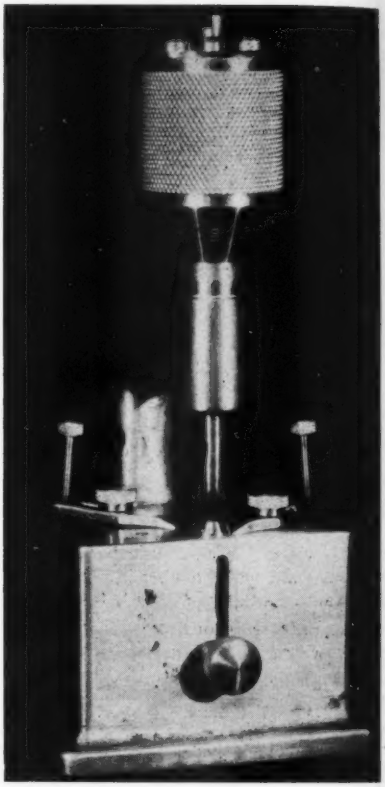
The Frisbie Combination Tool

By JOS. A. SCHWARZ

In bringing this tool before the horologists of this country as well as of Europe we have tried to manufacture a tool of very high standards and precision. In no way has expense been spared to make this tool of the highest quality and precision. This tool has nine stumps, six of which are solid face and three hollow face in graduated sizes. It also has fifteen cutters (reamers), fifteen pushers and two clamps to hold the movements or plates to the table.

This tool is entirely new and different than anything ever shown to any American or European watchmaker. The spindle is fitted so close that the side shake is one ten thousandth of an inch or less. The lower center which holds the anvil is fitted with the same accuracy. When the spindle is fitted with a male center and the anvil (stump) is removed the lower center can be used thus making the tool a very accurate uprighting tool with clamps to hold the plate or complete watch. The clamps are adjustable and can be used in different positions on the table and will hold firmly the smallest watch plate, bridge or any movement up to and including a thirty seven size auto clock movement. The lower center can be raised and lowered and locked in any position with the thumb screw. The spindles are hardened and ground. The main part of the tool is made of dairy metal, a metal that does not rust or corrode. All other parts are of stainless steel. This tool is not nickel or throme plated as the plating would tend to destroy the accuracy of this tool.



This tool also has a very high grade micrometer that will compare with the

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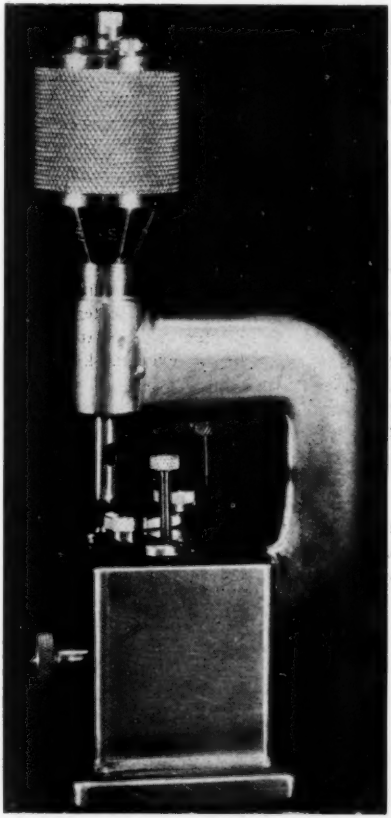
best M.M. micrometer on the market for the watchmakers' use. The threads on the micrometer are exceptionally large and accurate to give it the extreme accuracy desired. When the tool is used as a micrometer the spindle is locked firmly in the micrometer head and is used the same as an ordinary micrometer. The graduations are one one hundredth of a M.M. The movement of the spindle is thirteen M.M. When using the stump (anvil) as shown in the photograph the micrometer is an excellent tool for measuring the outside diameters of friction jewels.

The main and outstanding feature of this combination tool is the jeweling attachment for setting friction jewels. The watch plates or bridges can be clamped firmly to the table and centered from above or below or both if necessary. The exact position of the broken jewel can be recorded with the micrometer and when the new jewel is pressed in by reading the micrometer the operator will set the new jewel to the exact depth of the old one.

Occasionally the watchmaker has a watch with thin plates where it is necessary to set a friction jewel, with this tool the watchmaker need have no fear of bending the watch plate or bridge when pressing in a new jewel. The reason for this is because the stumps can be raised from the bottom so they touch the watch plate and are then locked in place so there can be no give in the plate. All jeweling jobs on this tool must be clamped tightly against the table as soon as the job is centered. This feature makes it impossible to set a jewel at an angle. The smallest lever bridge can be held and centered with just as much precision as the large watch plate. The cutters (reamers) used on this tool are entirely different than those used on any other tool. Some types of reamers are hard to control as they follow the way of least resistance which changes the depthing between centers. With this tool this mistake cannot be made. The reamers are hardened and ground and are fitted to the spindle with a taper joint that cannot turn and is always centered. The hole cut by the reamer is the exact size of the reamer and is always straight. We recommend using the highest grade jewel obtainable with the use of this combined tool.



Clocks Take Strange Forms

A thin square of opaque glass mounted on pewter forms the face for a smart modern clock. Numerals are pewter, too. Another clock built on the square comes in wood, highly decorative in its grain. Here, brass numerals are set flush with the honey-colored wood and the face is framed in a deep glass box.

Is Watch Material Interchangeable?

By FRED M. LUND

The answer is no. Without the skill of the watchmaker, all material, both American and Swiss, would not serve any purpose whatsoever.

In fitting new material in a used watch, the part must be co-ordinated with other parts in order to make the watch function as a timepiece. In selecting a piece from a lot of material made for a given watch, the watchmaker must pick one that is nearest to the measurements required; always a bit larger. In spite of the fact that many watch concerns advertise absolute interchangeability, there is always a slight difference in sizes.

The workman must then reduce diameters, or lengths of pivots, shorten shoulders, change angles of escapements, round up wheels or even make slight changes in the watch itself to accommodate the fitting of a new part. Then he must not only make the watch run, but make it perform up to a very rigid standard of accuracy.

A timepiece is the only servant that man has, that makes a record of its own mistakes, and the only one that works for him night and day. It is, therefore, the knowledge and skill of the watchmaker that the consumer must depend on, which fact should be emphasized in dealings and in conversation with customers.

The emphasis placed on the interchangeability of watch parts tends to lead the public to the belief that most anyone can repair a watch; certainly most any kind of a watchmaker. This idea must be strongly combated by our trade. It is the craftsmanship and service of the watchmaker that the watch owner buys, when he has his timepiece overhauled and not the material that may be installed. This is perhaps more definitely true of watchmaking than of any other business, and calls for a self appreciation on the part of the watchmaker, that should be reflected to his customer.

The great purpose of the United Horological Association of America and all affiliated craft organizations is to foster and aid the development of knowledge, skill and efficiency among watchmakers, which in time will dignify them to the level of a profession instead of a trade.

Denies Rumor

Charles Granger, superintendent of the Waterbury Clock Co., said today that his concern has not gone into the manufacture of dolls, denying a report circulating in local industrial circles. With respect to business generally, Mr. Granger said that it was "about the same." The plant has a personnel at the present time of about 800, "when they are working," Mr. Granger said.

Make all good men your well wishers, and then, in the years' steady sifting, some of them turn into friends. Friends are the sunshine of life.—John Hay.

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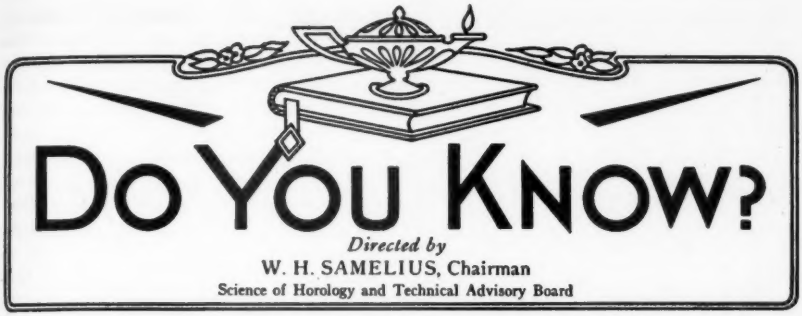

Directed by
W. H. SAMELIUS, Chairman
Science of Horology and Technical Advisory Board

The following affords a simple means of copying a drawing on ordinary opaque drawing paper: Stretch the paper over the drawing in the usual way, soak it with benzine by the aid of a cotton pad. When the paper becomes completely transparent, the drawing can be traced, either with pencil or india ink. The benzine evaporates on exposing the paper to the air, leaving it in its normal condition.

The banjo clock that has been so popular for years was invented by Simon Willard and patented in 1802. It was an 8-day non-striking clock with about a twenty inch pendulum. Because of its shape it was called a banjo clock.

The diameter of a watch crystal can be reduced by centering in a lathe, chucking it between two pieces of cork or a pair of cork arbors, applying a moistened piece of glass to the edge. When the desired diameter is obtained, polish the edge in pumice stone followed by putty powder, applied with a cork.

To clean brass articles: In a stoneware vessel, make a mixture of one part of common hydro-chloric acid and one-half part of sulphuric acid. Dip the article into it for a few seconds, rinse well in hot water and dry in saw dust. If the brass is greasy, it should first be dipped into a solution of potash of soda in warm water.

The flying pendulum, or bob suspended by a cord and caused to swing in a circular motion was patented by John C. Briggs, 1885. It was called the Briggs patent flexible pendulum. Several of the clocks were made in the United States.

One of the earliest Torsion pendulum clocks was patented by Knoblauch & Company of Berlin, Germany, 1881. It has a verge escapement. Today, however, the Torsion clock, or 400 day clock as it is commonly known, employs the deadbeat escapement.

The first pickpocket preventative appears in a patent issued to Benjamin Cartwright, January 31, 1749, for a secret spring to secure the watch in the pocket or to the side. The spring is fastened to the wearer's dress by a spring or two small screws and the watch chain falls into or is attached to a loop, which by an easy pressure locks as to prevent the watch from falling out of the pocket or being snatched from the side. The loop may be easily opened again by touching a small knob or button.

Hon-Woo-Et-Low, or copper jars dropping water. A form of clepsydra at Canton, China, said to be between 3,000 and 4,000 years old. It consists of four copper jars arranged on steps. Each jar drops water into the one below until the last one, in which a bamboo float indicates the time in a crude way.

The clock in the old belfry of Old North Church at Boston, of Paul Revere fame, was built by an American clockmaker, Avery, 1726.

It was John Arnold, an English watchmaker, born 1736, that invented the helical form of hairspring such as used today in all marine chronometers.

Trade Agreement and Watches

Reports to the New England Council at its quarterly meeting in Hartford last week showed conclusively that New England industrialists are opposed to trade agreement programs as effected and planned by the administration, even if not antagonistic as a whole to the principle of reciprocity. The watch industry, in which Waltham is peculiarly interested, is one of those which have suffered most acutely through the agreement with Switzerland. The attitude of the administration appears to be that when a foreign country can produce an article so it can be sold cheaper in this country, the interests of domestic concerns engaged in the manufacture of that article are to be wholly disregarded. Carried to its logical conclusion, this view will lead to lower wages, a lower standard of living for American workmen, and more extensive unemployment.

How Waltham's principal industry was affected by the reciprocal trade agreement with Switzerland may be seen by the report on clocks and watches to the Council.

"Watches were on the agenda for the negotiations with Switzerland. Our industry submitted a brief, made personal appearance at the hearing and presented our case to the best of our ability. Our pleas were unavailing and the tariff with Switzerland was reduced 50 per cent on certain classifications of watches. We feel that the importations which have materially increased have definitely affected our wrist-watch business, which at this time is practically stagnant and necessitated a substantial reduction in price at the first of the year. Using 1934 as an index of 100, our business for 1935 was approximately 120; 1936—137; and 1937—80.

"Using the last quarter of 1934 as 100, the last quarter for 1935 was 127, 1936—137; and 1937—69. Because of this wrist-watch stagnation we are now operating our wrist-watch business at less than 20 per cent of capacity. It is difficult to appreciate the many factors surrounding the business done in any single commodity but our opinion is that the falling off in demand is due more to the reduction in tariff granted under the Swiss reciprocal agreement than to any other reason."

In brief, the policy pursued by the administration in negotiating trade agreements with Switzerland disregards the welfare of the watch industry, both the manufacturers and the men and women whose hours of employment have been lessened by the competition with the cheap labor of Switzerland into which they have been forced. It is not an encouraging outlook for the thousands of skilled watchmakers whose employment is rendered precarious.

Dr. D. W. Hering, 88, Railway Engineer and Physicist, Dies

Professor Emeritus and Senior Faculty Member of New York University

Dr. Daniel Webster Hering, 88, railroad engineer, who became professor emeritus of physics at New York University and senior faculty member there, died at his home, 2208 Andrews Ave., the Bronx.

Dr. Hering was curator of the James Arthur collection of timepieces at the university, regarded as one of the finest. He had charge of more than 2,000 timepieces, some of them hundreds of years old. The university valued them at $150,000.

Born in Maryland

He was a native of Smithsburg, Md., and received a Ph.B. degree at Yale University in 1872 and a C.E. there six years later. He was a Fellow of Engineering at Johns Hopkins University from 1876 to 1878.

He was associated with the Berks County and Baltimore and Cumberland Valley Railroad as an assistant engineer. In 1880, he left railroading and became professor of mathematics in Western Maryland College.

He went from there to Western University in Pennsylvania, and in 1885 he came to New York University, remaining active until 1916. He was dean of the graduate faculty from 1902 to 1915, and was appointed curator of the clocks in 1926. He worked actively at this post until recently.

He was a noted writer on scientific subjects, and published several volumes on physics. He wrote of his love of clock collection in "The Lure of the Clock," published in 1932.

Studied Church Acoustics

He made a particular study of church acoustics, compressed air, X-rays, and so-called rainmaking and rain-controlling devices. He was president of the physics department of the Brooklyn Institute for two years and was vice president of the New York Academy of Science.

He belonged to several scientific societies. His wife, the former Mary Hollis Webster, died in 1930. He is survived by two daughters, Doris and Hollis Webster Hering.

Largest Clock

Big Ben on the 300-foot tower of the Houses of Parliament in London, is said to be the biggest clock in the world. It measures 21 feet across each of its four dials, and Englishmen claim that it is also the most accurate clock in the world.

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Watchmakers' Guild of New London

The Watchmakers' Guild of New London held their meeting in Norwich on March 15th. A banquet was provided, and we invited the owners and managers of the stores, in which our members work. We also invited a group of watchmakers, who work in this district and as yet do not belong to the Guild, but whom we expect will soon become active members, according to our observations and their statements.

Mr. A. R. Raphael, our National Vice President, was present as well as the state officers of the state association. There was a very good attendance, and Mr. Raphael explained the aims and objects of the organization; also talking on the legislative committees' activity and that a bill will soon be presented in our state.

Our State President, Mr. Seibel, spoke on the benefits and reasons why watchmakers' legislation would help us and that it is hoped that through such an act that misleading advertising in our field would be eliminated.

Mr. Stowe of Hartford spoke on the organization, or their guild, which is a large and active one.

Everyone present was in the best of spirits, and I am sure that they all understand what the organizations stand for and that there will be a definite increase in our guild as well as the state and national organization.

ALFRED K. MOULTON,
Secretary.

Connecticut Horological Association

Big state meeting being sponsored by the Connecticut Association and the New Haven Guild will take place at the Hotel Taft, Friday May 20th.

All watchmakers, jewelers and those of the trade are cordially invited to participate at this meeting, which will be a gala event. Prominent speakers on varied subjects will be at hand, including our National Executive Secretary, who promises us a most entertaining and enlightening address.

"Texas, You're Welcome"

"Mr. X is now in Texas. A few months ago he was the proprietor of a "gyp" watch repair shop in downtown Milwaukee. On his front window, he had a sign advertising watch repairing at 60c with the figures "60" five feet in height. He paid his watchmakers an average of 10c per watch. Every watchmaker including his employees, hated him for making of the trade a "penny-ante" racket.

"Mr. X ignored the rules of N.R.A., challenged the rulings of the compliance board and N.R.A. was impotent to control him.

"The Wisconsin Board of Examiners in Watchmaking notified Mr. X that he was violating the Wisconsin Statutes regulating Watchmaking and warned him that prosecution would follow if violation continued. Mr. X defied the State Board, bragged that N.R.A. couldn't stop him, that the Wisconsin licensing law was unconstitutional, that we couldn't "legislate him out of business," etc.

"A deputy Sheriff called on Mr. X with the District Attorney's warning that Mr. X could comply with the law or go to jail. Mr. X complied, took off the 60c sign. His business, founded on bait advertising, was reduced to nothing. He laid off first one watchmaker, then the other, and finally went out of business. Mr. X is now in Texas. Don't bother to thank us, Texas. You are welcome to this enterprising business man."

Signed:

THE WISCONSIN WATCHMAKERS ASSOCIATION.

This is a concrete example of what our law is doing in Wisconsin. Getting rid of this man has done a lot to raise the morale of the watchmakers in Milwaukee.

The history of the United States shows a more rapid advance in power and importance than has ever been made by any other nation.

Helpful Books for the Horologist

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By D. W. Hering. Every bench man and store should possess this book. 121 pages, 99 beautiful illustrations. **Price postpaid, $4.00**

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ED-14 One milling fixture and wheel cutter using Geneva chucks. All above tools fit to W. W. Slide Rest.

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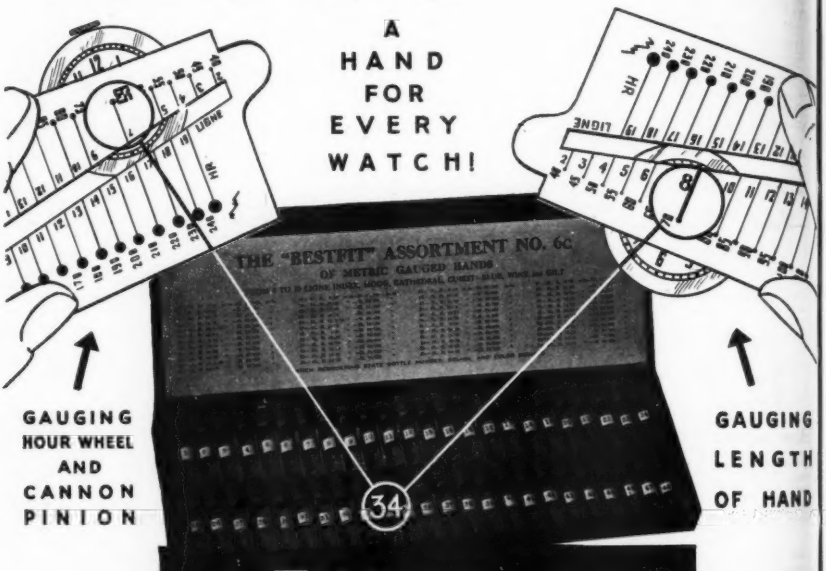

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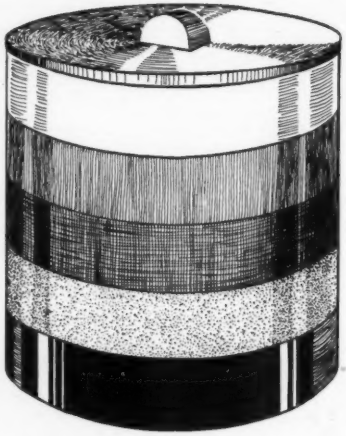

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